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THE ANNUAL MEETING AT DETROIT

The indications for a successful meeting were evident from the start. At the opening exercises there was some disappointment at the non-appearance of Governor Ferris and Mayor Marx, who were to deliver the addresses of welcome. Official duties were responsible for this; Mr. Lee appeared as the representative of the Mayor and delivered a well chosen and hospitable address. This was responded to in an appropriate and agreeable manner by Dr. Tait Butler of Memphis, Tennessee on behalf of the association. To demonstrate that his interest in the veterinary profession was more than a perfunctory one, Governor Ferris came to the association headquarters Tuesday evening and entertained the members with an address which, with numerous humorous allusions, showed his appreciation of the relation of the veterinary profession to the commonwealth, the progress it has attained and the importance of a sound educational foundation preliminary to veterinary training. Dr. J. G. Rutherford of Calgary, Canada, whose oratorical ability has been well tested on numerous similar occasions, followed with a speech which ably supplemented that of the Governor and conveyed the thanks and good will of the members for the interest

and trouble taken by the Governor to keep his belated engagement.

Social entertainment was afforded Monday evening by a reception and ball. Tuesday evening there were various alumni suppers and gatherings in addition to the Governor's address. On Wednesday evening a very enjoyable banquet was held in the ball room. Dr. Dunphy officiated very acceptably as toastmaster. This list included remarks by Dr. W. Horace Hoskins, Dr. Tait Butler, Dr. Kedzie, Dr. W. H. Dalrymple, Dr. J. G. Rutherford, Dr. E. M. Ranck, and Dr. J. W. Adams. The speeches were entertaining and uniformly brief. Entertainment was provided for the ladies by a sight-seeing trip of the city, including Belle Isle, and a very enjoyable theatre party. On Thursday the association was the guest of the Parke, Davis Co. The company was a bountiful host. After conveying the members and friends by boat to their manufacturing plant, numerous guides were furnished to pilot the visitors through the various departments. There was much to interest and instruct. The remainder of the day was spent in a boat ride up the river into Lake St. Clair, on the steamer *Britannia*. Boxes containing an appetizing lunch were served on steamer to 1000 or more guests. The bounty of the hosts will long be remembered by those fortunate enough to be present.

The papers on the program were of timely interest and importance and received appropriate discussion. Undoubtedly the greatest interest centered around the business session of Thursday evening, at which the new officers were elected and the report of the Committee on Reorganization was presented. Dr. C. E. Cotton of Minneapolis was elected president without opposition. The vice-presidents chosen were: Doctors G. W. Dunphy, Michigan; F. A. Bolser, Indiana; S. Hadwen, Canada; V. A. Moore, New York; L. H. Howard, Massachusetts. There was some rivalry for the secretary's office. The names of Doctors Merillat and Mayo were presented. Dr. Haring announced that he was not a candidate. The vote turned in favor of Dr. Merillat and upon motion of Dr. Mayo his election was made unanimous. Dr. Schneider was re-elected treasurer and Dr. Frost librarian.

The report of the committee on reorganization aroused animated discussion. A report, so comprehensive in scope involving some new and untried features, is naturally susceptible to criticism. It was the endeavor of the committee, as announced by Chairman Cary, to profit as much as possible from the efforts of

former committees without losing sight of whatever merit was possessed by the old constitution. As previous notice had been given, the report was presented for adoption at the Detroit session. Dr. Campbell, of Chicago, submitted to the members printed copies of a pamphlet on "A Plan for Reorganizing the American Veterinary Medical Association" based upon his service on previous committees. An amendment to the report offered by Dr. Klein, to the effect that the curriculum of twenty-eight months, involving four collegiate years, should go into effect in 1916-1917 instead of 1917-1918, was passed by the association. Much of the debate centered around the requirement of one year's high school work or its equivalent in studies taken in other preparatory schools. The report was adopted.

Among the new features is a member at large on the executive board to be elected at an annual meeting, the other five members being elected by mail ballots from districts based on geographical arrangement. The former honor roll was omitted and these members, like all active members, will hereafter pay their annual dues. To replace the honor roll and as a recognition of long and faithful service, the former honor roll member is to be designated as a Fellow of the A.V.M.A., a certificate to that effect being issued by the secretary.

The executive committee, formerly appointed annually, is to be replaced by an executive board to be nominated and elected by mail ballot from five districts, each district to elect its own member. In addition there is to be a member at large elected by the association at an annual meeting, making a board of six members. The term of office of each member is five years; so that, after the plan is organized, one member will drop out each year and a new one elected by the constituents of the given district. This arrangement gives greater continuity of service and should promote efficiency and yet arranges for the introduction of new blood from one of the districts annually. The chairman is to be elected by the members of the board.

A new feature is a committee on budget. This is to consist of the president, secretary, treasurer and chairman of the executive board, those most familiar with the financial condition of the association. The function of this committee is largely to keep the expenditures within the income.

The committees on intelligence and education, and legislation are arranged for continuity of service similarly to the executive board, except that the members of these committees are appointed by the president. After organization one member will drop out each year and the president will appoint his successor for a term of five years.

Although it was voted at the Oakland meeting that the annual dues should be increased to five dollars, a point had arisen, which questioned the correctness of the action. On this account notices for the 1916 dues had not been sent out by the secretary previous to the meeting. The matter was decided in favor of the \$5.00 dues. The fact that the treasurer's report showed a balance on hand of \$1349.00 with the 1916 dues as yet uncollected, and while the association was still on the basis of three dollar dues, reflects much credit upon the efficiency of the outgoing administration.

The possession of a balance or reserve fund is necessary for the success of any organization but it also has its dangers. If more money should, perchance, be available, more methods may be devised for dissipating it. A successful organization is measured more satisfactorily by the results accomplished rather than by the amount of money it can spend. Under all conditions it is desirable that there should be suitable ballast to keep the ship of state properly balanced.

Approximately 400 members, 300 visiting veterinarians, and 275 ladies were in attendance, a total of nearly 1000.

The association received invitations to hold its next meeting at Mobile, Alabama, and Kansas City, Mo. The claims of each were eloquently presented.

Dr. Archibald, Secretary Haring and the other officers are to be sincerely congratulated on the success of their administration. Much effort has been expended in making this one of the most successful meetings in the history of the association both in attendance and in the results accomplished. The new administration will have new problems to solve, new difficulties to overcome. We know their standard is progress and with the proper cooperation of the members every effort will be made to maintain the standard that has been set, and, if possible, advance it.

P. A. F.

THE STERILITY OF THE FREE-MARTIN

When twins of different sexes are born of cattle the female is called a free-martin. In rare instances cases of normal fertility have been recorded but the general experience of breeders for some centuries past has been that such female twin is sterile. Statistical evidence has not been abundant and such as there is, is not exempt from confusion.

Twins may be produced from a single ovum "identical twins" in which case they are always of the same sex, or they may be produced from separate ova, in which case they may be either of different sexes or of the same sex. In any case if the twins are of the same sex (homosexual) they are likely to be fertile, but if of different sexes (heterosexual) it is the female which is barren, except in rare instances, in the case of cattle. Statistics do not throw much light upon the causes which produce the free-martin. These must be sought from the embryological side.

In a recent paper by Dr. F. R. Lillie (Science, April, 1916) some interesting facts are presented which appear to offer a rational basis in this matter. He has examined forty-one cases of bovine twins *in utero* and found fourteen homosexual males, six homosexual females and twenty-one heterosexual twins: the sum of the homosexual being about equal to the heterosexual twins.

If the sterile free-martin and its masculine mate could arise from a single ovum they should be included in a single chorion and there should be but a single corpus luteum present. If they arise from separate ova we should expect two separate chorions and two corpora lutea. The condition of a single chorion, however, he does not consider a conclusive test of origin from a single ovum as two chorions originally independent may fuse secondarily. The observations in his forty-one cases showed that about 97.5 per cent of the bovine twins possessed a single chorion, but in spite of this condition nearly all of the twins developed from separate ova. The basis for this belief is that he found a corpus luteum present in each ovary. In normal single pregnancies in cattle there is never more than one corpus luteum present. He believes therefore that in cattle a twin pregnancy is almost always a result of the fertilization of an ovum from each ovary. Development begins separately in each horn of the uterus. When the embryos meet in the cavity of the uterus, the blood vessels from each side

then anastomose in the connecting part of the chorion; a particularly wide arterial anastomosis develops, so that either fetus can be injected from the other, the arterial circulation of each also overlaps the venous area of the other, so that a constant interchange of blood takes place. If both are males or both are females, no harm results from this; but *if one is male and the other female, the reproductive system of the female is largely suppressed, and certain male organs even develop in the female.* This result he believes is unquestionably to be interpreted as a case of *hormone action.* (A hormone is a substance which is capable of exciting chemically other substances.) It is not yet determined whether the invariable result of sterilization of the female at the expense of the male is due to more precocious development of the male hormones or to a certain dominance of male over female hormones.

Steinach's experiments in changing the sexual characteristics of young rats by the implantation of parts of the sexual apparatus from the opposite sex appear to have a confirmatory bearing upon this view.

It is reported that sterile free-martins are very rarely found in sheep. In four twin pregnancies in sheep examined by Lillie, he found in each instance a single chorion for each fetus and that each had developed from different ova; the circulation was therefore confined to each fetus.

Fundamentally, then, the conclusion seems to be that when the twins are of different sexes and the chorions fuse and the circulations of each fetus overlap, the female results in a sterile free-martin, because of the male hormones. This condition is more common in cattle. If the chorions do not fuse and the circulation of each fetus is closed, then the female is fertile. This condition is more common in sheep.

In the very exceptional cases in cattle where the female of the heterosexual twins is fertile, it is to be assumed that the chorion and circulation for each fetus remained separate, as is usually the case in sheep.

P. A. F.

The marriage of Miss Anna Lisabeth Corwin and Dr. John McCartney is announced. They will be at home at "The Franklin," Middletown, N. Y., after Oct. 1,

EUROPEAN CHRONICLES

Bois Jerome.

GLANDERS IN MAN.—It is very fortunate that the contagion of this disease to human beings is of very rare occurrence, and when such takes place and a veterinarian is the victim, the fatal end is generally recorded. Sometimes a full and long description of the sufferings of the patient are given in, at least, the professional papers and yet in other cases the sad news is scarcely mentioned or perhaps treated briefly in an obituary.

Cases of recovery from an attack of glanders in man, when the nature of the disease has been established in a positive manner, have not, I believe, been recorded. Years ago there was a report of one recovery spoken of and published in the pages of the *American Veterinary Review*. But unless I am in error, this is the only one I can allude to.

For these reasons, I confess to neglect in overlooking the authentic case described in the *Journal of Comparative Pathology*, in 1913.

In the March number of this year of the same Journal the case is *de novo* brought before the attention of the readers and this time I will notice it.

In 1913 Mr. S. H. Garger, M.R.C.V.S., then in the military service in India, reported the full history of an infection with the *Bacillus mallei* from which he had suffered. At that time he thought it had terminated in recovery after a series of suffering and various manifestations, lasting a period of two years and four months.

The main features of this first attack as published were: ((a) "Infection occurred by way of the alimentary canal: (b) a period of three weeks elapsed before the disease became visibly localized, during which time there was high fever and rheumatic pains and a diagnosis was impossible: (c) the disease localized itself in the left hand, after a slight blow: an acute infection setting in by way of the lymphatics with the hand lesion as its starting point: (d) this acute lymphatic invasion was overcome and a chronic form of disease supervened, frequently aggravated by unavoidable surgical interference: (e) an occasional blood infection occurred, causing lesions in remote regions of the body, such as the right wrist, and left ankle, these then forming new centers from which the disease developed locally, and from which it was conveyed by way of the

lymphatics to groups of glands nearer the body: (f) the larger number of the lesions were connected with the lymphatic system, either in the glands or on the course of the vessels, their predilection seat being the neighborhood of joints, the ankle, wrist and knee especially: (g) the disease lasted for a period of nearly twenty-eight months and nearly proved fatal on two occasions, namely, during the first acute attack and at a critical period a few weeks after the left arm was amputated: (h) the total number of operations was forty-five, of which twenty-seven were done under chloroform: (i) the treatment was surgical, vaccinal and general."

After such a terrible experience the author considered himself cured because of the sound healing of all the local lesions, the disappearance of all traces of inflammation, the gradual whitening of the scars, the return of almost complete freedom of movement in all the parts affected and the complete return of a former fit condition and an increase of weight to above the normal.

But all of these were subservient to an essential condition it seemed, namely: that the defences of the body should not become weakened by another attack of some disease.

Garger was still in India and an attack of malaria developed and then, the apparent recovery from glanders, considered complete in June, 1912 and which had lasted until the middle and latter part of February, 1914, disappeared as manifestations again became evident. Garger was again admitted to the hospital on March first. A period of a little over seven months had elapsed between the two attacks of glanders.

Then began a long series of various symptoms of suppurations, of synovitis, of periostitis and necrosed bones, of rebellious nasal hemorrhages, of neuralgia, of formation of abscesses demanding several surgical interferences, etc.

The manifestations of temperature varied from day to day and accordingly the developing of the lesions. As to the form of treatment followed, this was altogether according to the indications and certainly these were many if one reads of the great variety of drugs which were administered or applied: soothing lotions, dressing with tincture of iodine, applications and injections of peroxide of hydrogen. Internally, purgatives, calomel, arsenic, aspirin exalgine, phenacetine, caffeine, morphine, heroin, bromides, chloral, adrenaline, strychnine, digitalis, etc.

I cannot follow the minute description so thoroughly given by

the author in his sojourn at the Lahore Hospital and the Walker Hospital, Simla, until his return to England, nor the detailed presentation of the ravages made by the *Bacillus mallei* found at each examination but will remark that this wonderful condition has at last come to an end.

During the first attack, forty-five operations were performed and during the second thirty-seven. A total of eighty-two operations which have spotted his whole body and limbs with ugly cicatrices, and with all, left him mutilated by the amputation of his left arm, and yet the author, victim of his profession, still writes in January, 1916: "I believe that I have recovered and that, provided I remain in a healthy climate, there will be no further relapse, but this, only time can show."

A terrible prospect, is it not, for such a brave and courageous man?

REMARKS ON GLANDERS.—That this disease is and has probably prevailed among the horses of the various armies of Europe now engaged in war, is a fact that was expected. It has always been so in all wars, but probably in our day the possibility of its early detection has reduced the danger of its spreading a great deal. Malleination and principally the palpebral method, has had a great opportunity to demonstrate its undoubted, practical and scientific value and its general application must have been the occasion for many remarks and interesting observations. Such indeed has been the case with veterinary Majors Cazalbou and Meyer of the French army, who have reported some of their experiences at the *Société Centrale* and which are published in the bulletins.

The authors give first an account of an epizootic, which had broken out in a group of campaign artillery. Classical glanders, cutaneous and suspicious lymphatic lesions had been noticed in some horses and palpebral malleination was applied to 520 horses.

The positive results were: 6 cases of nasal glanders, 9 of cutaneous glanders with lesions on the legs or other parts of the body such as lymphangitis, cutaneous ulcerations, farcinous cords, ulcerated farcinous buds, etc., and 49 cases of pulmonary glanders without the slightest external symptom and all in fair condition.

These 64 positive cases were destroyed.

The test having revealed the presence of the disease in 18% of the whole number of horses and of those, in the 64 sick ones, 76%

which presented no symptom. A great proportion, which might have been raised, as knowing that in all cases of the cutaneous or nasal glanders there are always pulmonary lesions, it is possible to admit that 9 cases, classified here among the cutaneous, had pulmonary glanders as well and that if they had not been wounded, they would have remained as the 49 others unsuspected and in that case, for the clinician, the proportion of these unsuspected would have reached 90%.

From this history of the outbreak and the consideration of the results, three important observations are made by the authors which deserve attention.

1—Taking into consideration the question of the late origin of the contagion and admitting among the possible dates, the one that this origin goes back to five or six months after the exposure, the question of the morbid evolution is then, that after such exposure and with the hygienic condition of war time, a group of horses may be invaded in the proportion of 18% and that out of the sick animals, from 76 to 90% may not present any symptoms.

The conclusion is that pulmonary glanders is anterior to the nasal and that the cutaneous affection is an accidental form of the disease. A consequence, imposed from this, at least in war time, is that it is therefore necessary to resort to palpebral malleination at periodic epochs for the whole number of horses so as to detect, rather than awaiting, any cases of latent unsuspected pulmonary disease that may exist.

2—A striking analogy between glanders and tuberculosis seems also almost possible to the authors.

“From the clinical point of view, there exists, for instance, a pulmonary stage in both affections. A stage which spreads towards the anterior respiratory tract: tracheitis, laryngitis, ulcerative rhinitis for glanders, ulcerative laryngitis for tuberculosis in man.

“To the anatomo-pathological point of view, the lesions can be compared and easily arrived at the purulent or caseous softening in pulmonary tissue and lymphatic glands; while on the skin and mucous membranes, it is the chancre that appears.

“In relation to the diagnosis, it is sufficient to mention the analogy of reaction between malleination and tuberculation. In relation to the mode of contagion, it is known that infection is easily realized by the digestive tract, with either the bacillus of glanders or the agent of tuberculosis. The infection is also realized by the

respiratory tract, at least for the bacillus of tuberculosis and for that of glanders. Dourin and Naudinet have mentioned the propagation of the disease by irradiation on the subjects of a stable on the left and the right of a diseased animal.

"There exists also a certain analogy between the development of cutaneous glanders after a traumatism received by a sick horse affected with the internal form of the disease and the tuberculous ulcer of man infected with Koch's bacillus.

"What is the nature of the influence brought by the traumatism upon an invaded organism?

"From the point of view of the final nature of glanders, there exists between it and the mycosis group an evident analogy."

"Tuberculosis has been considered as a mycosis. From what is known to-day of the general characteristics of glanders, it is proper to place it as a mycosis with the sporotrichosis, epizootic lymphangitis, aspergillosis, tuberculosis."

3—The last remark presented by the writers rests upon a simple question: As long as Nocard has demonstrated that glanders can be cured, why not try to obtain this result with horses affected with pulmonary glanders *only*, which would be condemned by mallein? Would it not give an occasion for the study of this curative action of mallein upon as wide scale as possible?

ABOUT THE FORAMEN OF BOTAL.—This is the résumé of a communication made before the *Academie des Sciences* by Veterinary Major P. Chaussé.

His attention having been called to the frequency of cardiac malformations in cattle and swine, he was brought to investigate in what proportion the non-occlusion of the foramen of Botal existed in calves, adult cattle, sheep, pigs, horses, and dogs and he has found unexpected and very interesting results.

Except for the dog, the investigations were made on abattoir animals, killed for public use and without being selected. The existence of the inter-auricular communication was observed in 530 calves three months of age 161 times, in 540 cattle of all ages 87, in 522 sheep 33, in 545 pigs 103, in 273 horses 1, in 62 dogs 3 times.

From these figures the following information was drawn: In a general way, the frequency of this malformation heretofore unknown, is remarkable in calf, adult cattle and pigs. In these spe-

cies, the opening allowed the introduction of that of a probe 2 millimeters in diameter to, in general, the thumb or the index finger.

The condition is analogous in calf, adult cattle and pigs: the course of the communication is oblique in such a way that often the wall of the septum forms a small valve, and the blood returning from the left auricle into the right is prevented entirely or in part. In about one-third or one-quarter of the cases, the opening admits at least the thumb: but in proportion to the size of that of the organ, it is not large.

In cattle, the foramen of Botal is normally closed a few days or a week before birth, the figures given above relate to calves about three months old; sometimes, however, the foramen closes later: indeed at three months the proportion of those not closed is 30%, while in adult bovines the proportion drops to 16%.

In pigs, the above statistics relates to subjects from 6 to 10 months of age and the figures are somewhat near those of adult bovines. In proportion to the organ the opening is larger in swine and this may permit the mixing of blood.

In sheep, only a small number has been observed where the opening remains narrow. Similar observations have been made with dogs.

In horses, only one case was found, out of 270 subjects. The opening admitted the entrance of a large lead pencil, one centimeter in diameter. It was small and could not give rise to much circulatory disturbance.

To summarize, the presence of the open foramen of Botal is common in cattle and pigs, animals which work but little and it does not seem to interfere with their general health, but when the opening is large, it may promote a rather moderate cardiac hypertrophy. The foramen remains open exceptionally, in horses and in dogs, animals in which the heart is called to the maximum of activity. In sheep, it remains open quite rarely.

“ABOVE ALL NATIONS IS HUMANITY”—Such is the beautiful heading of a little paragraph which the worthy editor of the *Journal of the A. V. M. A.* has written in the May number.

Among his remarks he says: “*Many have lost not only a thriving practice, but even their families and homes and the only asset left them is life itself.*”

This was the true and only motive that suggested to me the organization of a league *essentially* in behalf of the Belgian veterinarians.

The paragraph then continues: "*Such cases may perhaps be found in all the countries affected, but undoubtedly some are more seriously affected than others.*"

Can any be more affected than the Belgians, because of the location of their country and the events that brought about the results?

And again: "*Although each nation or its allies in the present conflict, probably has some method or relief fund for alleviating those in acute distress*****"

Of course, but can it be expected that the Belgians in their distress and in this horrible hour of need can look for assistance from an organization of their own similar to those to which allusion is thus made? No.

When the hostilities are over, when peace has brought an end to the terrible struggle, and the Belgian veterinarians will be able to return home, it is then that, using the words of our editor: "*Our brother practitioners, who have lost their all, through no fault of their own*" will be in need of help and support, of financial aid to start life anew. That is the only object for which the Anglo-Franco-Belgian relief fund has been organized.

The French veterinarians have already subscribed over 30,000 francs, the English nearly 200 pounds sterling, Americans, a small amount, so far only 20 dollars. But America is the land of generosity and *above nations there is humanity.*

Funds can be addressed to Asselin and Houzeau, Treasurers, Place de l'Ecole de Medicine, Paris. All subscribers can remain assured that the League will do its best to bestow the gift where needed, namely to Brother Veterinarians in Belgium.

Short bibliographic acknowledgements:—The Fourth Annual Report of the Commissioner of Animal Industry, 1915, by Doctor Lester H. Howard, D.V.S.

Farmers Bulletin 713, from the Bureau of Animal Industry: Sheep Scab by Veterinary Inspector Marion Imes.

From the Research Laboratory of Parke, Davis and Co.: The action of a coal tar disinfectant on hog cholera virus, by Drs. W. E. King and R. H. Drake.

A. LIAUTARD.

MODERN REQUIREMENTS IN THE SHOEING OF HORSES—ESPECIALLY IN CITIES*

ROBERT W. ELLIS, New York, N. Y.

For many years, (as the result of the advent of the automobile) the consequent changed conditions of street surfaces has been more or less at all times, a great menace to the safety of horses, but especially after a light shower at any season and in the winter from ice. This latter condition resulting from the modern system of removing snow from the streets as soon as it falls, thereby rendering the old plan of sharpening the calks on the horses' shoes impracticable.

For a considerable time I have been longing for the development of some form of shoe that would be adaptable to the present conditions at all seasons.

You will remember, (many of you from having heard the paper read, and most of you from having read it in the *American Veterinary Review* for January, 1915) a paper presented to the Veterinary Medical Association of New York City, entitled "Horseshoeing in Many Countries", by Mr. W. J. Kent, of New York City, in which he briefly reviewed the history of horseshoeing from the time of Xenophon who tied leather soles on with straps, followed by the fibre soles, the pouring of tar on sand and walking the horses over it, thus making an artificial sole, the metal sole adopted by the Romans in Nero's time, and finally the iron shoe, fastened on the hoof with nails, as first adopted by the Celts.

All of these methods of shoeing, it will be seen, have had for their object the protection of the hoof from breaking or too rapid wearing. As a matter of fact, that continued to be the object of shoeing, with the exception of the sharpening of the calks for ice, down to our own day and generation. Advance was made in the details of shoeing, as in the better mechanical preparation of the shoes and of the feet, but the principles remained the same.

During the life-time of the present generation, it became evident that the harder, smoother road surfaces called for something else besides protection from breaking and too rapid wear; it required some form of shoe to relieve concussion and give the horse's

*Presented at the meeting of the New York State Veterinary Medical Society, Ithaca, N. Y., August 3, 1916.

foot a hold on the street surface that a steel shoe did not give; and the many forms of pads were developed, first made from some sort of composition and later of rubber. All these pads required at least a three-quarter steel plate to retain them in position and protect the wall of the foot.

Then a channel shoe with rubber filling was put on the market, I do not know in what year, but my first recollection of it dates back probably to seventeen or eighteen years, possibly twenty. They appealed to me, and I put them on my driving horse in the winter and drove him over the snow-covered street, (that was before they used to remove the snow and leave us an ice-covered surface in its place) with impunity. I remember well an old horseman who used to drive a four-in-hand of four Wilkes stallions to a two-wheeled cart, stopping me to see what I had on my horse, that enabled him to go so fearlessly, as he could see that he was shod plain.

That shoe was not suited for plain, wet, or ice-covered asphalt surfaces, as the rubber contact was not sufficient, and it would not stand the wear and tear. The same applies to the rope-filled channel shoe.

So for many years, as the street conditions have continued to grow worse for the horse, being constructed more and more along lines favorable to the automobile and unfavorable to the horse, the demand for a shoe that would adapt the horse to the streets, has constantly increased, and was met only when the principle of shoeing the automobile, (for which the streets had been constructed) was imitated.

You all know what a hazardous thing it would be for a man to drive over asphalt streets in an automobile with steel tires, and you all just as fully appreciate your position in driving a horse with steel shoes, or even with the best kind of pads and steel tips, over an oily, smoothly-worn asphalt street after a five minutes shower, because many of you have experienced it. The only thing to do is to imitate the shoeing of the automobile with an all-rubber contact of as broad a surface as possible, in order to protect the horse from strains or more fatal injuries and your client from financial loss due to the same.

The public too, has become deeply interested in this problem from a humane stand-point, and in New York City this past spring, the Board of Aldermen attempted to pass an ordinance compelling

horse-owners to shoe their horses and mules, between the months of November and April, in such a manner as to prevent slipping; but were unable to pass it, as the owners did not feel that the humane societies who were behind the project, were capable of determining just what constituted such shoeing; and the veterinarians felt the same way about it, and so opposed the measure. This opposition by the veterinarians, was not fully understood, (probably due to the manner in which they went about it) and the societies formed the impression that the veterinarians were arbitrarily opposed to humane measures. I did not attend any of the aldermanic hearings, but a few days before the last hearing was to be held, a committee waited upon me at my office, and requested me to give an expression of my views that they might use them at the final hearing. I told them that I believed that horses should be shod, not only between the months of November and April, but at all times so as to prevent slipping, but I did not think it a fair proposition to give any one on the street the power to arrest a man because the man on the street, (or the woman, still worse), thought the horse was not properly shod.

"I would not like to relinquish the right to be the judge as to how my horse should be shod," I said, "as the man on the street may not know as well as I do, how to shoe my horse for my work, and my clients would feel exactly the same about it."

They then remarked that my horse was always out in all weathers and street conditions, and asked me how I managed it. "How do you shoe him"? one of them asked. "The same as my friends who use automobiles shoe them", I replied. Then at their request. I showed them the shoes I was using. They became interested and wanted to know how such shoes were procured. I told them that they were in the open market, and any horse-shoer could get them, the same as he got his nails and other necessities. They asked me if all veterinarians knew about them and I said: "Why certainly, as I have explained to you, they are on the market". Then they asked me if I would not discuss them with my colleagues at some time, and I finally yielded by promising that at some time I would have something to say regarding the requirements of modern conditions in relation to horse shoeing, hence this paper, which I am sure is going to get me in hot water, particularly because it is not possible to prepare a rubber shoe at the forge specifically for the foot that you are going to shoe, and some of my

friends will remind me of the old caution against fitting the foot to the shoe instead of the shoe to the foot. I welcome the chance of an argument along that line, however, as it will give me an opportunity to endeavor to eliminate from the minds of my colleagues, some of the prejudices that the actual use of a rubber shoe for nearly three years, has eliminated from mine. So as my desire is to make this paper as brief as possible, I will endeavor to go straight at the subject.

We all know that an unshod hoof will take a firm hold on a yielding surface, such as turf or dirt road, and that that same hoof, when protected by the addition of a steel shoe, will take an equally firm hold under the same conditions; but will not take hold on an unyielding surface, and is a positive menace to the horse's safety on a smooth, polished, unyielding surface, such as our present city streets. So that, as the street surface is unyielding and smooth, we must, while protecting the hoof from breaking or too rapid wear, make it yielding and clinging on its own surface; and rubber is the one material we know of today, that will fill that role, and at the same time, possesses the requisite wearing quality. We must shoe with rubber. The demand for such a shoe has been met, and there is now to be had, a shoe that not only fills that demand, but by its construction, tends to broaden an abnormally narrow, or contracted foot. One of the fundamental principles and the most important step in the shoeing of a horse's foot, is to have that foot absolutely level, so that every segment of the limb from the pedal bone up, will meet its fellow with a level articular surface. The second step is to apply to that foot a shoe whose surface, both in relation to the foot and to the ground, is absolutely level—no matter whether it is a steel shoe or a partly rubber shoe. That is one of the principles of horse shoeing from which we must make no departure. With your permission, to illustrate its importance, I will cite a case from my practice.

A horse was brought to me with the history of being slightly lame. I rode behind him and found him to be unmistakably lame in one fore foot and took him to the forge to remove the shoe to examine the foot. When the smithy had removed the shoe, I took the foot in my hand to examine it, and noticed it was not level. I looked it over more carefully and found the foot a half inch higher on the outside than on the inside. I asked the shoer to lend me his apron as I wanted to try an experiment, (I did not want to hurt

his feelings as he had shod the horse), and I took a rasp and leveled that foot, had the same shoe put back (it being level), told the owner to put on a wet bandage from the coronet to above the pastern and keep it wet. I called to see the horse the next day and he was going sound. It was one of those feet that I shall refer to, as growing on one side only, the outside in this case, having its normal obliquity, while the inside wall was vertical. I saw to it that that foot was kept level after that, and the horse continued to go sound.

When it comes to the width, length and conformation of the foot, we can approximate a normal foot so nearly in a ready-made shoe, that even the limitations of cold fitting will permit all the changes in it that are required; and even in the case of an abnormal foot, or one of bad conformation, after adhering to the principles of a level shoe and a level foot, it has been my observation, that it is often a good thing to fit the foot to the shoe. We are dealing with an abnormal foot, we will say. Probably it grows only on one side, so spreads on that side and not on the other. In a foot of that character, if the unilateral contraction is but slight, I would fit the shoe so as to give as much fullness at the quarters and heel as it has on the normal side, allowing the shoe to extend beyond the foot wall. If the unilateral contraction is excessive, of course I do not fit the shoe quite as full as in the normal foot, but still leave it pretty full. The rubber shoe that I have had experience with for the past three years, will permit of opening or closing as required. Its surface is absolutely level and can readily be fitted to any level foot. I am not speaking theoretically, but from the stand-point of one who has shod horses. I never did it for a living, but I learned the art of shoeing when a youth. This shoe is so constructed that it not only prevents slipping, but also reduces concussion to a minimum and expands the foot, because the rubber does not only come in contact with the ground surface, but also with the wall of the foot and a portion of the sole. That is, contact to all intents and purposes, being divided only from those parts by a layer of cotton duck. This contact with the sole for an inch or more inside the wall, causes a gradual, healthy expansion of the foot.

In the case of my own horse, a pair of No. 3 fitted him the first time he was shod with this style of shoe, and the next time, it required a $3\frac{1}{2}$ to give him the proper support; and so you see that I virtually fit the foot to the shoe. The inside of his foot approached the vertical more than the oblique direction, because the

inside of his foot did not grow as fast as the outside. It was therefore without the same degree of contact a good part of the time, because the outside of the foot would grow and lift the inside up from the bearing surface. But by shoeing him full on the inside I gave him a wider base and better bearing on the ground surface, which, together with the pressure upward and outward on the sole and wall, effected by the form of the shoe, tended to gradually but effectually spread the foot, so that at the next shoeing he required the larger shoe, which he has continued to wear. Hence fitting the foot to the shoe proved to be not only practical but highly beneficial. The horse in question, on account of the contraction, was going a little sore and placing his feet down with great care, which gave him a mincing, limited stride; so you can appreciate my gratification, more, enthusiasm, when the horse not only soon traveled with freedom and confidence, but began to display a little action, a qualification that evidently belonged to him, but had not been possible to exhibit on account of the tenderness and consequent lack of confidence. Furthermore, the horse was wearing three interfering boots up to the time he was given the wider firmer base of support by this shoeing, and has never required them since.

I could cite a great many similar cases in my practice, but do not think it is necessary to bring out my object, which is, to get my colleagues to *interest themselves in the shoeing of their clients' horses to meet the modern street conditions*, not only from the commercial side, which interests our clients, (as despite the usefulness of the automobile the horse is a great necessity in our cities and in greater New York approximately 110,000 are still in use) but also from the humane side, in which we are intensely interested; just as much interested as any of the societies that devote all their time and energy to that one end,—more earnestly interested than some of them.

You and I feel that it would not be just to pass an ordinance that would place the matter of proper shoeing in the hands of any one that comes along, but we also know, that a very great many horse-owners make no attempt to shoe their horses to meet street conditions. Never is that more clearly demonstrated than after a snow fall, when all teams are engaged that can be procured, and we have the painful sight of horses slipping, sliding and skating all over the streets with plain steel shoes on. The humane societies go after them and they appeal to us, and we naturally try

to protect them, but feel in our hearts and souls that they ought to do something to protect their horses against the straining that such slipping causes. This society has adopted as its slogan, "the Humane Treatment of Animals" and we as its members must be consistent if we would command the respect of the good people that give their lives and their fortunes to the protection of the animals that afford not only their owners, but ourselves, a means of support. So I come to you, not to indorse this shoe because I have found it to be the best yet produced for the purpose, as I am not in the least interested in the shoe or any one connected with it as you of course know. (To be fair to the producers of it, I should add that they have not the slightest idea that I am reading this paper, or exhibiting their shoe.) But I wish we could think more about this problem of shoeing horses to meet modern conditions. If we put all sentiment and all humane feelings aside it should interest us, because it is the street conditions more than everything else together, that is taking our horse clients from us. They will tell you so themselves, and I know it is a fact. Many men who want to use them in business have ceased doing so, not because the horse's work can be done any better or cheaper, on the contrary, but because of the street conditions. Let us try to meet them as much as possible by shoeing. It is the only way that we can do it.

PROBLEMS IN MILK PRODUCTION*

H. E. COOK, Canton, N. Y.

I early became mixed up in the milk business. All my life in one way or another I have been interested in milk, in manufacturing butter or cheese or other products of milk in some form. Considered as a whole, the milk business is one of the most complicated and difficult of solution of any industrial question before this country today.

Milk is our most perishable food product. That makes its handling very complicated at the start. So many people are engaged in its traffic; that adds to its complication. Then the nature of the business; its origin and development add not a little to the difficulty of solving the problems.

*Delivered before the New York City Veterinary Association, May 3, 1916.

It has partly, at least, come about in this manner: farmers had to have plant food. They wanted fertilizers and so they kept cows. As a result cows have been kept, raised and milked in such vast numbers that milk became a by-product and manure the essential product. A fundamental factor in the law of economies is that the value of a by-product has no relationship to the cost of raw material from which it is made. Hence, we found ourselves producing milk at less than the actual cost of labor, feeds and other overhead charges incident to the business. The only way found to save the farms in New York was to introduce dairy cows. Cows were rushed on to farms all through the east and to the middle west, not to make profit, but to make fertilizers until we had so much milk we did not know what to do with it. We know now how to grow crops without cows, but we have learned these things only in recent years. The producers, however, did not handle and sell the milk; they turned that over to other people. That gave rise to new problems.

Then came laws to control the quality of milk. These laws have been conducive of wholesomeness and purity but not in advancing the price, yet price advances have taken place in respect to all other products. People accept these advances without a word. If, however, a small advance is suggested in the price of milk, the air at once is disturbed with protests. The city papers cry out to the effect that the milk trust has shown its teeth, encircling out in every direction those words spread.

The fact is, not one quart of milk in ten quarts that goes into New York City has charged against it the total cost of production. If all legitimate charges were made and paid, producers would go bankrupt. The milk that goes to the city trade is the work of the family, —father works, mother works, the children work. Suppose the milk checks are paid. Is the wife or the children paid for the labor they put into the production of milk? The fact is, these workers are unpaid and every day their labor is put into milk production without full compensation for what they do, but people won't do this always. Uprisings are occurring in the country. Wives and children some of these days are going to strike. It will not be a question of higher wages but of payment of wages for labor actually expended at nominal prices for it.

I believe dealers are working on small margins in handling milk. This is not the rural belief or sentiment, but, nevertheless, all things considered, the profit that the dealer makes on each quart

of milk is small. What is, therefore, the logical conclusion? Just this: consumers must pay more for milk or they must be content with cheaper methods in its production. It won't be the latter, hence milk must go up in price.

Farmers are entitled to a labor compensation and a fair return on their investments. Cheaper methods of distribution are possible, but cheaper methods of production are not possible. The average good dairyman can not possibly lessen the cost price of his milk. Producers are entitled to as much profit and consideration as either the carrier or the distributor.

I am interested to know if transportation can be lessened. Apparently the railroads are getting more than their fair share, providing they were paid enough at the outset. The transportation is now efficiently organized, long trains are handled, it is an every day certainty and does not have to be exploited.

Producing milk is a business and to produce clean milk costs more money; yet the fact remains that but little more is paid for clean milk. Moreover, the men who produce clean milk are from the very nature of the business, a class of producers whose standards of living are high. They refuse to be classified with incompetent producers or submit to a low scale of living. A low scale of living means a poor grade of milk. Milk made under dirty conditions is not fit to use.

Dairymen are making themselves better in order to produce better milk. In doing this they have got to get more for their milk because it costs more to produce it, and because the people who produce it cannot live under the conditions where dirty milk is produced. An important step in better milk is 'better cows. Dr. Moore, whom we all know and all respect, has worked out a plan whereby we can register healthy herds. The registry of healthy cows does not mean that they are all to be full-blooded. You can not take a few cows, put them together and make a healthy herd. It takes time to develop healthy cows, with strong udder tissue, good digestion and free from communicable diseases.

We have been accustomed in the past to consider milk cheap and more or less a contaminated food. A new era is spreading before us and some of us now understand that milk must be kept from contamination after it is drawn from the cow. Permit me to prophesy that the pathological and physical condition of the milking cow will be as prominent and as important in the judging of milk

quality before another decade has passed, as the bacteria count is now.

My own opinion is that our present standard of measure is not ideal and only half correct. The problems are to free cows from tuberculosis which we fairly well understand, and to clear away abortion and kindred troubles, which we soon will understand and control. I am speaking now of certified not of the cheaper grades of milk. What is wanted is to maintain a normal, physical condition of the cow from day to day by a sane system of feeding and care. This means high grade intelligence at every point. It means more costly milk, and must put it into a class by itself.

We have fought oleo with butter made from filthy stables and we all know the result. A similar verdict awaits the milk business unless laboratory hygiene and sanitation coupled with physiological strength, vigor and purity get into the stable, factory and the dairy cow. We have discovered to our sorrow that sunlight and country air do not destroy pathological bacteria around a farm home as fast as negligence and ignorance develop them. We have learned that a rural birthplace and the little red schoolhouse are no longer a charter of wisdom or a certificate of broad-shouldered strength. We have discovered that a man does not have to be born in the country to be a farmer any more than a veterinarian must be born in a clinic.

The pure grades of raw milk generally known as certified are better and safer than pasteurized milk and consumers know it, but, of course, as producers we must not lose sight of the essentials in its production.

In regard to pasteurized milk, I believe that the average market milk is better when heated. We have had many sad experiences with tuberculosis, due to feeding skim milk to dairy herds. Yet very many people who would be protected by such legislation oppose the change. The difference between good milk and market milk is the difference in men. You cannot make high grade or certified milk with every type that comes along. We have passed the time in the certified field when the barn is to be the dominant factor. We want a certified cow. To get a certified cow means room to let the young cow loose. She should be allowed to run loose from calfhood until she takes her place in the dairy herd. The feed should be uniform throughout the year.

Still another problem. It is to have consumers appreciate the food value of milk, to let them know what an extensive process is involved in milk production and to appreciate the full food value of milk. This can be done by advertising; but advertising can only be done by dealers. The producers are too numerous to be organized. Cheaper methods of distribution will in time be worked out. Then the control of the milk and cream supply will be done by a single corporation or it will be done through municipal ownership. One or the other is coming. Either would cheapen present methods of distribution.

As now organized, the government offers no safe chance for business enterprises. We have no policy anywhere; in the small town, in the city or in the state. Where there is a three-headed commission we say there ought to be one, and where there is a one-headed commission there ought to be three. Ours is a state without a policy. The government ought to run its business this way. Unfortunately, when we get a new administration, everybody is expected to drop his work and a new set of men take it up. Occasionally men continue through different administrations. That is a little better, but still bad, because of uncertainty. "To the victor belongs the spoils" has not been eliminated from the minds of men.

Until this is eliminated, handling big business problems such as the milk traffic cannot be as economically administered by government as by individual or corporate interests.

There has been developed, however, a workable system of government supervision of big business that does have the endorsement of the people. It is just as logical and workable to have a single combination in New York City to handle milk as to handle telephone messages. Two telephone companies tried to do business in New York State, but when they combined better service resulted than when we had two systems. Efficiency goes up as competition goes down. Competition is ruinous and is not the life of business. Cooperation today is the life of trade.

If we could save a half cent through combining all of the milk concerns, it would mean much, but that saving should go wholly to the producer. What a tremendous advance a half cent a quart would mean in milk production! More than efficiency is wanted. You cannot get a big harvest done with a short cutting bar, no matter how sharp the knives or well geared the machines. The whole milk business is not, but should be, properly organized and properly

linked together. Prices have got to advance; consumers must be made to understand that they are getting their full money's worth in paying more for a better product. Railroads, dealers and producers, all parties concerned must work to give each full justice.

I believe thoroughly in organization to obtain a larger profit for the milk producer. It must come, however, from a full knowledge of all the factors involved: production, transportation, distribution; any other plan will produce anarchy and warfare which multiplies expenses and which in the final balancing of accounts the producer must pay.

THE OCCURRENCE OF THE GIANT NEMATODE, *DI OCTOTHYME RENALE* (*EUSTRONGYLUS*) IN THE UNITED STATES AND CANADA

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The giant nematode, *Diocotthyme renale*, or, as it is more commonly known, *Eustrongylus gigas*, or *Eustrongylus visceralis*, is one of the most striking of parasitic worms and one which is not likely to be overlooked in autopsies. Recently the writer had brought to his attention 3 cases of its occurrence in dogs in New York State and this led him to search through the literature for other records for the United States. These proved surprisingly few, and in an attempt to get together data which might possibly be of aid in a study of its life history, letters of inquiry were sent to leading workers in parasitology and in comparative anatomy in every state and in Canada. Of these the great majority replied that they had never personally noted the worm, though several stated that they had for years watched for it in the course of their studies.

For these reasons it seemed worth while to bring together the data collected, as well as to place on record the cases above mentioned. I shall first deal with the unpublished cases and then bring together such records as I have found noted in the literature. This summary makes no pretense of being complete but may lead to the placing on record of additional information regarding this interesting species.

I am under obligations to all who have so kindly responded to my inquiries as well as to those who furnished positive data, men-

tioned below. Especial thanks are due to Drs. Ransom, Hassall, and Hall, who put at my disposal the records of the Bureau of Animal Industry of the U. S. Department of Agriculture.

UNPUBLISHED CASES. I. A pointer dog which was being fumigated with nitrobenzene for external parasites, in the Department of Entomology of Cornell University, died during the process. As many other animals had been subjected to this treatment without untoward effect, by Professor William Moore and his colleagues at the University of Minnesota, and by Mr. W. L. Chandler and myself at Cornell, we promptly held an autopsy to determine the cause of death. On opening the abdominal cavity two large female specimens of *Diocotylome renale*, measuring some twenty-two inches in length, were found overlying the left lobe of the liver, closely crowded between it and the diaphragm. The general pathological conditions, to be reported upon more fully by Mr. Chandler and the writer in a forthcoming paper, were such as to leave no room for doubt that the predisposing cause of death of the animal was the presence of the parasites in this unusual position.

The dog was born and reared in Georgetown, S. C., and had been in the north but a few days. It is to be noted that it was a male, a point of special significance in view of the suggestion of Sonsino 1897, that *Diocotylome renale* may enter its host through the genito-urinal aperture and that occasionally in female animals it may gain entrance to the peritoneal cavity by passing into the uterus and finally through the funnel of the fallopian tube. There was no sign of injury of either of the kidneys, and there was no evidence of earlier lesion which would indicate the escape of the worm from those organs.

II. A male specimen of *Diocotylome renale* is preserved in the collection of the New York State Veterinary College at Cornell University. There are no further data regarding it, but it is very probable that the specimen was collected at Ithaca, in the course of the work of the Veterinary College.

III. One specimen, a female, was found by Dr. Israel Kleiner, in the peritoneal cavity of a mongrel at the laboratories of the Rockefeller Institute, New York City, December 15, 1914. I have not available information as to the sex of the dog. Since it was suffering from experimentally induced peritonitis there were no pathological conditions noted as due to the presence of the worm. For bringing this case to my attention, I am indebted to Dr. F. S. Jones, who determined the specimen.

IV. This interesting case is reported by Dr. O. V. Brumley, of the Ohio State University. The host was a female dog, weighing perhaps sixty pounds, and apparently in fine physical condition, which was being used for operative surgery. "On making an incision through the abdominal walls one of the parasites was found at the point of incision. Upon investigation we found that there were several of these parasites present in the abdominal cavity. After we had disposed of the animal, an investigation of the kidneys was made. One kidney was apparently normal, the other one about four times larger than normal, and upon opening it we found it to be filled with the females of this same species. The kidney substance itself was entirely destroyed, nothing but the capsule left, and it was very much thickened. *****The remarkable thing so far as I could see was that the animal during life showed absolutely no symptoms of any infestation. It was quite evident that the kidney not effected was taking care of the excretions made without any difficulty". Dr. A. G. G. Richardson, referring to the same case, states that two of the worms were found in the kidney, and four in the abdominal cavity.

V-VII. Dr. Arno B. Luckhardt, of the Department of Physiology, of Chicago University, reports the following three specific cases. In each the host was a female.

"I first met the worm about 1910 or 1909, during a laparotomy in what appeared to be a perfectly healthy dog. On opening the peritoneal cavity I noticed the worm, but supposed it to be a highly hemorrhagic loop of bowel which was swaying gently from side to side. On taking hold of it, and finding it free from mesenterial attachments, I found I was dealing with a giant worm. It was the largest specimen I have ever seen, measuring about one meter in length. It was the only specimen present, both kidneys being free from the worms."

"Early in June, 1914, Dr. Keeton brought a dog to the laboratory from Albany, New York. It was a well-fed fox terrier. Soon after its arrival it began to vomit. At first the vomiting was attributed to the double vagotomy (above the diaphragm) performed shortly before its arrival in Chicago. The dog vomited incessantly. As a result it rapidly lost weight. All procedures instituted to check the vomiting having failed, Dr. Keeton etherized the dog and at necropsy found that vomiting no doubt arose reflexly from the stimulation of the peritoneum by the irritation of six or seven of

the worms under discussion. These worms were free in the peritoneal cavity."

"Last summer (1915) I disconnected the Pawlow pouch from a brindle pug that I had used for some research work during the previous year. On entering the peritoneal cavity the first structure which came to view was a kidney worm. The peritoneal cavity was thoroughly explored but no other worms were found. I still have the dog".

VIII and IX. Reported by Dr. T. W. Hastings, of the Cornell Medical School, New York City. "Two cases, only, are recalled. One dog had hematuria and in both cases a post-mortem showed the worms in the pelvis of the kidney. Details of the cases were not recorded."

X. Professor E. M. Walker, of the University of Toronto writes "A pair of these worms, male and female, were sent to me last spring (1915) from the Provincial Board of Health, Toronto. They had been taken from the abdominal cavity of a small dog in Toronto. The female measures about 60 cm. and the male 41 cm."

XI. Professor Walker also states "In our museum there is a specimen of the kidney of a mink, containing a coiled-up worm which I have always believed to be this species. It occupies a greatly dilated pelvis of the kidney, the glandular part being very thin and atrophied. This specimen, I believe, was taken at Go Home Bay, Georgian Bay, Ont., but I am not certain."

XII. Dr. J. Percy Moore informs me that there is in the collection of the Academy of Natural Sciences of Philadelphia, a large female specimen from the kidney of a coyote. "No locality is given but as Dr. Horn spent much time in western collecting trips it was probably secured on one of these."

This record is accompanied by data relative to the two specimens in the Leidy collection, reported below.

XII-XVII. There are preserved in the collection of the Bureau of Animal Industry, at Washington, D. C., specimens from six cases of infestation of dogs by *Diocotthyme renale*. One of these cases has always been reported by Sommer, 1896. Dr. M. C. Hall has kindly given me the following data regarding the others:

XIII. From visceral cavity of a dog, Washington, D. C., 1909. Collected by Dr. Robert Formad; determined by Dr. Hassall.

XIV. At least five worms, of which two were preserved, from the abdominal cavity of a dog shot as a rabies suspect. Negri bodies demonstrated. Collected by Dr. Formad, July 19, 1908.

XV. One specimen from the abdominal cavity, in contact with the liver, of a dog. Collected by Benj. McInnes, at Charleston, S. C., Sept. 17, 1908. Determined by Drs. Hall and Hassall.

XVI and XVII. No data.

XVIII. One case of the parasite in a dog, observed by Dr. Guthrie, of the Department of Physiology, of the University of Pittsburgh Medical School "a number of years ago". Reported to me by Dr. R. E. Sheldon, of that institution.

XIX. Dr. F. Robert Zeit, of the Northwestern University Medical School, Chicago, Ill., reports having found the worms repeatedly between 1910 and 1915, in stray mongrel dogs, caught by the city dog catcher on the streets of Chicago. A number of specimens of the worms and of infested kidneys are preserved in the collections of the Pathologic Museum of the Northwestern University Medical School.

In addition to the above reported cases, Dr. Luckhardt, of the University of Chicago writes "Between 1909 and 1914, I met the worm several times free in the peritoneal cavity,—never in the kidneys."

AMERICAN CASES ON RECORD. As stated before, the published references to the occurrence of *Diotothyme renale* in North America are few. The following have been noted by the writer:

I. Breeder, 1882, in a communication to the Journal of Comparative Medicine, reports finding twenty-one round worms, "of the lumbricoid variety", varying in length from nine to twelve centimeters, in the abdominal cavity of a horse, after several days of suffering. "The kidneys were full of small, round holes about one centimeter in diameter. These holes were very numerous, giving the kidneys a worm-eaten appearance. The change was supposed to be due to the passage of the round worms through the gland tissue for two reasons. First, the holes passed through the capsule, as well as the kidney tissue, and a second worm was found in one of the kidneys". "Transverse sections of the openings gave them the appearance of pretty clean-cut holes at the expense of the kidney structure. Each canal was surrounded by a thin layer of inflammatory exudation, but the inflammatory action was limited to a very thin area, and evidently had not irritated the gland tissue to any marked degree."

In commenting on this communication the editor (W. A. Conklin or W. H. Porter) says "Undoubtedly this case is that properly entitled *Strongylus gigas*".

II and III. Leidy, 1856b, states regarding this parasite: "Frequent in the kidneys of the mink, *Putorius vison*, and occasionally occurring in the dog, *Canis familiaris*".

Stiles and Hassall list specimens from both sources in the Leidy collection. Dr. J. P. Moore writes "The Leidy collection at the University of Pennsylvania, under the name of *Eustrongylus gigas* includes two lots of the worm in question. One of them is a large female, altogether lacking data. The other is labeled 'from *Putorius vison*'. It is Leidy's No. 89, Stiles No. 4954, but no locality is given, the probability being that it came from the vicinity of Philadelphia. There are several of small and medium size".

IV. Sommer, 1896 reports finding two specimens in a kidney of one of fifty dogs examined for animal parasites at Washington, D. C. These specimens are preserved in the collection of the Bureau of Animal Industry.

V. Stratton, 1843, found four specimens, varying in length from six to eight and a half inches, in the peritoneal cavity of a bitch, at Kingston, Ont. He apparently was the first to suggest that in such cases "there is some possibility that they passed from the uterus, along the Fallopian tubes".

VI. Torrance, 1900, found an eighteen inch specimen in the right kidney of an Indian dog at Winnipeg, Canada. The parasites had caused the death of the animal. Torrance adds "Indian dogs in the vicinity of the big lakes are usually fed on fish which are thrown to them whole and uncooked."

VII. Leidy, 1856b, is also authority for the statement that a Mr. Joseph Jones, "of Georgia", found an eight inch specimen of this same species associated with *Filaria immitis*, in the heart of a dog. Some European writers cite Railliet as having reported such a case but he merely says "On en a vu aussi dans le foi, dans la cavité thoracique, dans le coeur (?), etc." Evidently he had the Leidy report in mind.

While this case is very generally discredited by parasitologists, I can see no good basis for repudiating it. Magnie, 1870, reports finding the worm in the pleural cavity of a dog.

VIII+. In addition to the above records, Stiles, 1898, incidentally states concerning *Diectoithyme renale*: "Welch and others have found it in Baltimore; several specimens are contained in the Leidy collection of parasites belonging to the University of Pennsylvania, and various members of this Bureau have found the parasite

in dogs in Washington, D. C." Most of these cases are referred to elsewhere in this paper.

REPORTED HUMAN CASES IN THE UNITED STATES. It is well known that *Diectothyme renale* may occur rarely, as a parasite of man, and a number of cases are on record. The following supposed instances are reported for the United States:

I. Engert, 1898. The case of a patient residing in St. Louis, Mo., who complained of sudden darting pains in the region of the kidneys. This was followed by diarrhea and by hemorrhage from the bladder. Later the patient moved to a region where the drinking water was strongly impregnated with sulphur. He experienced difficulty in urinating and passed a worm about 5-6 inches in length, and in a few days 5 or 6 more of varying length.

II. George, 1888. Patient was a man seventy-three years of age who had been gradually failing in health for a year, and who suffered from vague pains in the back. Following a severe attack of renal colic, "in a few days, he passed from the bladder a half dozen worms". The supposed worm seen by Dr. George "was about three inches in length, two lines in diameter, bearing some resemblance to the common earth-worm. He said the others were both longer and thicker". The patient died and Dr. George states that on autopsy "we found the right kidney enlarged, weighing two and a half pounds, not a particle of healthy or normal tissue about it. In external appearance it resembled a fatty kidney. We found no worms either in the kidney, ureter or bladder but, on section, we found unmistakable evidence of their habitation. About one-fourth the entire mass, including the pelvis and infundibula, presented the appearance of being eaten by worms; looked like a mass of dry curds."

III. Martin, 1891. A man sixty-six years of age, suffered intensely from pains centering in the region of the bladder, "every few minutes rising to void his urine, or trying to but failing, only a few drops would pass, which had the appearance of clotted blood,—or would coagulate in a little time into a firm clot". The patient was a traveling veterinary surgeon, or castrator, whose work subjected him to very great muscular strain, day after day. On the eighth day after treatment began, he passed two "worms", seven and fifteen inches in length through a No. 9 catheter. "These worms, or entozoa, were of a dark-red or brown color and about the

size of a small rye straw or a large knitting needle, somewhat resembling the *ascaris lumbricoides* found in the intestines''.

IV. Morehouse, 1898. Patient, in Ohio, had severe renal colic and seventeen days later passed a worm nearly a foot in length, followed in two or three days by a four inch and a seven inch specimen and, up to the time of the report, by fifty-five, varying in length from one inch to one foot. Concerning this case see the illuminating report by the family physician of the patient, Lewis, 1898.

The great majority of the supposed cases of infestation of man by *Dioc-tothyme renale* have been shown to be based on error. In this class must be placed the above four alleged cases. Those of George, and of Martin have been investigated by Sommer, 1897, and that of Morehouse has been explained by Lewis, 1898. The four cases are typical instances of pseudoparasitism, blood clots, fragmentary blood coagula, and casts having been mistaken for worms.

SUMMARY AND COMMENTS. There are herein reported twenty-seven definite cases of the occurrence of the giant nematode, *Dioc-tothyme renale* in the United States and Canada. Of these, nineteen are published for the first time, while eight were already on record.

A surprising number of the cases, twelve out of twenty-seven, or 44%, relate to the occurrence of the worms in the peritoneal cavity. This is probably due to the fact that most of the twelve were observed by physiologists, in the course of their experiments. In one instance the parasite is said to have been in contact with the liver, while in another, Case I, two of the worms lay over the left lobe of the liver, between it and the diaphragm.

Stratton's suggestion, made independently by Sonsino many years later, that the parasites may pass from the uterus along the Fallopian tubes, and thus finally come to lie in the abdominal cavity is not borne out by the above data. Case I relates to their occurrence in the abdominal cavity of a male host.

The four cases of supposed occurrence of *Dioc-tothyme renale* as a parasite of man in the United States cannot be accepted. In this connection it may be said that Dr. F. R. Zeit states that in three thousand autopsies he has never met with the parasite in man.

Available data furnish no safe basis for determining the percentage of infestation of dogs in this country. Sommers found one case in fifty examinations. The writer has found one out of ap-

proximately a hundred dogs. On the other hand Dr. Barker reports that it has not been met with in two hundred and five examinations.

While the present report adds considerably to the known cases of the occurrence of *Diocotylome renale* in the United States and Canada, it must be pointed out that this is the result of co-operation on the part of workers in every state as well as in Canada. As compared with Italy, where most of the cases in the literature have been found, the territory covered is enormous, and most of the reports have been negative. The parasite cannot be regarded as common in this country.

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AN APPEAL TO THE VETERINARIANS TO HELP IN THE FIGHT AGAINST TUBERCULOSIS*

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When I was invited by Doctor Mc Donough to address this meeting, and was told that I might talk upon any subject that I preferred, I felt greatly honored. Just at that time I was doing some work on the new treatment of tuberculosis in men, and was deeply interested in it. Recently it has occurred to me that there are certain very important agreements in the action of tuberculosis in men and animals, and while there is danger that I may tell you things that you are already more familiar with than I am, I trust that you will bear with me in view of the intense interest which surrounds the subject, and its incalculable importance so far as it touches human life, and the well being of the entire animal kingdom.

So far as I know, there is not very much to report that is new in the fight against the great white plague in animals and what is so deeply interesting us in the handling of human tuberculosis is in reality, a modification of Koch's method of using tuberculin. Whether this method can be profitably and effectively used in treating cattle, only time and careful experiment can determine.

As you are probably aware, the treatment of tuberculosis with tuberculin was advocated by Professor Koch about 1890, and was taken up by the medical profession with the utmost avidity. Unfortunately Professor Koch and his assistants were, comparatively speaking, setting sail on an uncharted sea, and were guiding their course largely by conjecture and by results obtained in treating other diseases. They had discovered a remedial agent of unknown power and unmeasured possibilities. They seemed to assume that two or three doses of the new agent ought to cure a case of tuberculosis, and tuberculosis they looked upon as an infection to be forestalled by a vaccination, like smallpox, or rendered harmless by antitoxin, like diphtheria. As both of these conceptions were erroneous, it is not surprising that these experimenters were disappointed in the results of their treatment.

*An address before the New Jersey State Veterinary Association, July 13th, 1916.

Professor Virchow, the most celebrated pathologist of the world, at that time, led a crusade against Koch's new remedy, and tried to establish the claim that the pitiful condition of the advanced consumptive was at least rendered worse by tuberculin, if it was not caused by it. He asserted that this agent "mobilized" the tubercle bacilli already in the consumptive's body, and dispersed them through the system to extend their work of destruction. Inasmuch as even minute doses of tuberculin do activate to some extent, the bacilli already present in the patient's body, and large doses may cause local, focal and constitutional reactions, there is a certain amount of truth in Professor Virchow's statement regarding the mobilization of the bacilli; but that they are drawn into the blood stream and passed all over the body in it, is not true.

At any rate the tuberculin treatment of tuberculosis in human beings, got a decided "black eye", from which it has not yet entirely recovered. Veterinarians know that tuberculin is not a poison and that it has no effect on healthy animals. Physicians seem to still cherish the delusion that it is a poison, and that it may seriously injure a healthy person even if it does not set up the very disease it is intended to cure.

The long and successful use of tuberculin, in testing cattle, has taught the veterinarians a most valuable truth, and these innumerable tests like the routine examinations of the urine in life insurance examinations, have had an extremely important bearing upon both the pathology and treatment of men and animals. As it is stated in the Report of The International Commission, of the American Veterinary Medical Association, in 1911: "That the Commission recognizes after careful study, that the tuberculin test is the fundamental factor in any policy having for its object, the control of bovine tuberculosis." (Circular 175, Bureau of Animal Industry, March 17, 1911.) This Commission consisted of such men as, Professor Ravenel, Doctors Hurty, Moore, Schroeder, etc.

As science advances, and as the search after truth by actual experiment supersedes the old so-called philosophical conception of medicine, by which it was in vain attempted to make the facts conform to a preconceived theory, the collateral branches of medical practice naturally are assuming closer relations with the great body of the profession and are themselves doing much experimental work.

In this particular instance, it would seem wise for the veterinarians to at least attempt the treatment of tuberculous cattle on a large scale with tuberculin. Unfortunately, with the limited time at my disposal, I have not been able to make a résumé of the literature sufficiently extended to show whether this plan of treatment has ever been carried out on a scale large enough to prove or disprove its value. There is no question that many cases of bovine tuberculosis recover and that many more would recover in animals, as well as in men, under more favorable conditions of life. The modern cow, like her owner, lives under entirely abnormal conditions which must be altered if dairy herds are to be kept free from tuberculosis.

However, I will not take up your time by enlarging upon this obvious truth. I wish especially to emphasize the fact that, in men and animals, tuberculosis tends toward recovery, and that a very little help at the opportune moment, will change the entire course of the disease. In this belief I find myself in accord with Professor Conn, who says (Report of Storrs Agricultural Experiment Station, 1898) "The fact is, that the more experience accumulates, the more we learn that many of these incipient cases of tuberculosis are only temporary, and that the animals in question, if kept in a favorable condition, will soon recover and may live many years of useful life." C. S. Phelps, the agriculturist of the Storrs Experiment Station, gives the history of four tuberculous cows, two at least of which, seemed to have recovered their health entirely, and the other two were greatly benefited simply by hygienic living. I have no doubt that there have occurred thousands of similar cases.

De Schweinitz reported (Bulletin 13 of the Department of Agriculture, September 19, 1896, page 17) "An animal originally tuberculous kept at the Station of the Bureau of Animal Industry, has received about three thousand c.c. of tuberculin in different injections extending over a long time. The animal is now well and fat and has entirely recovered from tuberculosis."

On page 21 of Dr. Gilliland's paper, (Report on the Results Obtained in the Eradication of Tuberculosis from a Herd by the Use of Tuberculosis Vaccine and the Bang System, read in Toronto in August, 1911)—favorable comment is made on the result of the treatment of twelve shorthorn yearlings, which had reacted to tuberculin, with tuberculosis vaccine and tuberculin. The comment concludes with the statement, that the "treatment had a dis-

tinative curative effect" and concludes as follows: "With this knowledge at hand, it was decided to keep the valuable reacting animals of this herd isolated, and handle them in accordance with the Bang System, as well as to treat them with tuberculosis vaccine and *tuberculin*. (*italics mine*). The summary of the treatment was that the intravenous injection of tuberculosis vaccine was given. The dose depended upon the age, size and physical condition of the animal, and ranged from 4 c.c. to 10 c.c. of a standard suspension of tubercle bacilli of the human type. This was followed at intervals of seven days, with increasing doses of tuberculin until three doses were given. Then a second injection of tuberculosis vaccine was given, the dose being the same as in the first instance. This was followed by three weekly injections of tuberculin, *increasing* (*italics mine*) the dose with each injection. Finally, a third dose of tuberculosis vaccine was given, followed by weekly injections of tuberculin; increasing each dose as before, until the animal ceased to react." It appears that these animals were killed in the course of three years, after these injections, and in none of them was any active tuberculosis found.

An analysis of this meagre account of the use of tuberculin as a supplement to the intravenous injections of a suspension of human tubercle bacilli, leads us to ask whether the tuberculin was not the unrecognized curative agent, while the tuberculosis vaccine was probably inert. At all events, inasmuch as injections of humanized bacilli have, so I am informed, in numerous cases proved ineffectual, and inasmuch as the tuberculin was given in increasing doses, and *until the animal ceased to react* (*italics mine*) the conclusion seems perfectly obvious that these experiments should be repeated without the humanized tubercle bacilli.

Perhaps all this has been done. If so, I should consider it a great favor if I could be fully informed in the matter. While Dr. Gilliland neglects to state the amount of tuberculin he injected (seeming to think it of little consequence), it is not probable that he used anywhere near the amount Dr. de Schweinitz reported that he used to cure a tuberculous cow, (*viz*: 3000 c.c.). The latter authority is also delightfully indefinite regarding the size and frequency of his doses, and whether or not, the considerable amount of the agent used, was pure tuberculin or a dilution. If pure German tuberculin were used at present prices, this quantity at retail would cost about \$1000. If used as Dr. Harrison tells me he

used it, in a dilution of 1-60, bought at wholesale, with a discount for prompt payment, the cost would be for 3000 c.c., about \$50.00, which added to the cost of expert attendance, isolation and ordinary care of the animal might make the attempted immunization of cattle with tuberculin too expensive for a routine procedure. Yet, in cases of very valuable cattle, the process, if successful, would pay many times over.

It seems to me, gentlemen, that the veterinarians are in a position to render an undying service to scientific medicine, by undertaking the immunization of all tuberculous cattle against tuberculosis by the use of repeated gradually increasing doses of tuberculin, until the animal will no longer react. Your work has proved beyond controversy, that tuberculin has no effect upon healthy cattle and that an injection of a drachm of a two per cent dilution of pure tuberculin will cause a reaction in ninety-seven per cent of animals in any state of active tuberculosis; except in the advanced stages, when the body cells are no longer susceptible to tuberculin.

On the other hand it seems to me, that the physicians should take a leaf from your book and insist on testing all children for tubercular infection. We unfortunately have ample proof that seven children out of every ten at seventeen years of age, have, or have had, tuberculosis, and that over 90 per cent of all human beings at death show that they have at some time in their lives, suffered from tuberculosis. This lesion should be looked for in every case in childhood and young adult life, and whenever found it should be treated with tuberculin until complete immunization is brought about, just as I have urged you to test all cattle and treat all the reactors.

It will be impossible to rid the world of *human* tuberculosis unless the bovine type can also be wiped out. Dr. Salmon said in 1904 (*Maryland Medical Journal*, p. 92, February, 1904), "The human tubercle bacilli are generally much more saprophytic in their characters, and far less virulent than those from most other mammalian sources, and it seems that the human organism has the power of attenuating these bacilli and gradually making them less and less harmful. But this influence for good must be continually counteracted by the infusion of extremely pathogenic germs from animal sources." Probably, although this assertion admits of some argument, bovine and porcine tuberculosis will never be ban-

ished from the earth while any large percentage of human beings are suffering from the disease. We have found that small, gradually increased doses of tuberculin will render a human being immune to the bacilli. The same agent that provokes the reaction in a test dose and shows without question that the victim is suffering from active tuberculosis, calls from the body cells the antibodies which will gradually destroy the bacillus and restore the body to health. The susceptibility of the body cells is a criterion of their power to evolve the antibodies which will bring about a state of immunity. These seemingly opposed states are co-relative and inter-dependent, and this is why the dose of tuberculin must be gradually increased to keep up a formation of the antibodies and to gradually overcome the encroachments of the tubercle bacilli. This is why dishonest dealers can "plug" cattle so that they become immune for a considerable time to the standard test dose. For the same reason, cattle suspected of having been plugged, should receive twice or three or even more times the usual test dose, so that the immunity to the standard dose gained by the first test will be overcome and the animal will react.

In testing human beings, we use from three to five doses of tuberculin, increasing each succeeding dose to five or ten times the strength of its predecessor, until we are practically sure that the patient cannot react: in other words, has no susceptibility to tuberculin and consequently, no active tuberculosis in his body, unless of course, as said before, the disease has advanced so that the susceptibility of the cells to tuberculin has been exhausted. This is a wonderful field of research whose confines are far beyond our ken. The two professions, the veterinary and the medical, or rather, the two branches of the one profession, that of the healing art, are requisite and necessary to each other just now, as never before. Let us unite, and advancing shoulder to shoulder, pass on into that great heritage of boundless knowledge which is opening before us.

While many of us may not live to see where this alluring research will lead, it is not unreasonable in view of the enormous strides which experimental medicine has made in the last decade, to assert that another half score of years will make equally astonishing advances, and that in many directions, notably in the control and treatment of tuberculosis, most of us will live to see a degree of success which has until the last few years seemed an iridescent dream.

The complete banishment of the "Great White Plague" from the list of human miseries, can no longer be asserted to be an impossibility. Our progress toward the goal in handling human tuberculosis has been wonderfully encouraging in the past few years. I hope that my feeble words will stir up our brethren, the veterinarians, to renew their attack on bovine tuberculosis. From this form of the disease, a large percentage of human infants are infected every year, and this source of infection must be wiped out through your efforts collectively and individually.

FEDERAL AID FOR RURAL ROADS. The sum of \$85,000,000 of federal funds is made available for the construction of rural roads, by the passage of the Federal Aid Road Bill which became a law on July 11, 1916. Of this sum \$75,000,000 is to be expended for the construction of rural post roads under cooperative arrangements with the highway departments of the various states, and \$10,000,000 is to be expended for roads and trails within or partly within the national forests. The act limits the federal government's share in road work in cooperation with the states to 50 per cent of the estimated cost of construction.

CATTLE SCABIES NEARLY EXTINCT. Seven Texas counties and a portion of another one are released from federal quarantine for cattle scabies by an order effective July 1. This order marks almost the last stage in the fight against this disease, which began in 1905. At that time 1,269,844 square miles were quarantined on this account. After July 1 only 3,817 square miles of this area will remain in quarantine.

A newspaper item states that Dr. Richard Ebbet formerly of Grand Island, Nebraska, has been deported from Ireland by the British Government. He has been in Ireland for about four years, twenty miles from Dublin. It is reported that he was returned to this country because he had written to friends here of the conditions in Ireland. It is stated that Dr. Ebbet will take up the matter with the Department of State at Washington and that he contemplates some kind of legal action against the British Government.

OBSERVATIONS ON 2800 PIGS INOCULATED WITH HOG CHOLERA VIRUS

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The following observations and experiments have been made upon 2800 pigs, inoculated for the production of hog cholera virus, at the Minnesota State Serum Plant, during the period of approximately two years ending December 31, 1915. The virus obtained from these pigs was used mainly for the hyperimmunization of hogs for the production of anti-hog cholera serum (Dorset-McBride-Niles method), although considerable was also used in the work of routine serum-virus vaccination (so-called "double treatment"). The observations recorded in this paper may not appear to be of any particular significance, in fact some of the conclusions drawn are already known to most workers with hog cholera, in a general way, but the fact that there are no published data on many of these points has prompted the author to report them.

When the word "virus" is used, we refer to the defibrinated blood obtained from a pig sick with acute hog cholera, the blood being defibrinated mechanically immediately after drawing, rather than allowing it to coagulate spontaneously. In a small number of cases (not over 5%) the blood can not be satisfactorily defibrinated immediately, but in these cases it will usually coagulate upon 24 hours standing at refrigerator temperature (4°C.). Experience has shown that it does not pay to use this blood, either separately or by mixing it with the blood from other pigs. The failure to properly coagulate is probably due to the absence or insufficient amount present of some one of the fibrin elements, and when the poor blood is mixed with the good, small shreds of fibrin are formed, making it difficult to handle and dangerous to use for hyperimmunization purposes. Almost without exception the pigs which yield the non-coagulable blood show very extensive hemorrhagic lesions on autopsy.

NATURAL IMMUNITY TO HOG CHOLERA. It is very interesting to note the fact that of the 2800 pigs inoculated, 390 (13.9%) failed to succumb to the infection. Failure to succumb means that the pigs either did not die of cholera, or did not at any time become sick enough to warrant slaughter for the purpose of obtaining viru-

lent blood. The optimum time for killing the pigs is usually determined clinically, the experience gained through observations made on several thousand pigs serving as a valuable guide. Experience has shown that it is best to allow the inoculated pigs to reach the height of their reaction, based largely on the temperature, but with other clinical symptoms taken into consideration, and bleed them before they become too weak. The pigs killed in the advanced stages of the disease will usually yield blood rich in the secondary invaders common to hog cholera. This is not only undesirable, but also unnecessary for the production of a potent anti-hog cholera serum.

The reactions following the injections of virus varied between the two extremes possible, namely, from no reaction that was noticeable, up to death in as short a time as five or six days (peracute hog cholera). Some of the pigs which did not die became severely ill, however, and then usually made a quick recovery. In the periods during which the pigs were under observation, careful clinical records were kept as far as conditions permitted. The necessity for handling large numbers of pigs in rather crowded quarters, at certain times of the year, prevented the keeping of detailed individual clinical records at such times.

The following table concerns the 390 pigs which failed to succumb. For convenience they have been divided into six groups, determined by the highest temperature shown following inoculation. Temperatures were taken once daily, at about 8 A. M., usually not earlier than the fourth day following inoculation. A marked rise of temperature before the fourth day could hardly be attributed to the injection of the filterable virus of hog cholera. It is much more reasonable to suspect prior infection, or a contaminated virus, where a marked rise of temperature is noted before the fourth or fifth day, or when death occurs before the fifth or sixth day.

TABLE 1.

Showing the percentage of 390 pigs (survivors) exhibiting different grades of susceptibility and immunity, classed by maximum temperatures recorded following inoculation.

Limits of maximum temperatures	Number of pigs	%	Grade of reaction	Grade of immunity
101.8-102.8	39	10.0	None	Complete
103.0-103.8	101	25.9	Slight	High
104.0-104.8	120	30.7	Moderate	Slight
105.0-105.8	84	21.5	Marked	None
106.0-106.8	36	9.3	Severe	None
107.0-107.4	10	2.6	Extreme	None

This grouping is entirely arbitrary, but in a general way the temperature reaction is a very good gauge for roughly determining the condition of the pigs. Once in a while a very sick pig will not show much of a temperature reaction, while on the other hand some pigs that appear to show little or no clinical symptoms frequently will show a surprisingly high temperature reaction. In the group showing slight reactions, as a rule there was rarely any other clinical symptoms manifest besides the slight rise in temperature. In the group showing moderate reactions, usually the pigs would be "off feed" for a day or so, and then show no further disturbance. In the groups showing "marked", "severe" and "extreme" reactions, very frequently there would be such symptoms as anorexia, depression, diarrhea, conjunctivitis, etc., for a day or so, but the condition of the pigs hardly warranted slaughter. In most such cases the pigs would be given a respite of twenty-four hours, at the expiration of which time the condition would usually be either unchanged or improved. In a few instances such pigs succumbed.

In a general way these 390 pigs might be divided into two great classes: (a) those which proved to be immune, or nearly so; and, (b) those which reacted noticeably to the injection of the virus, but made a recovery. It is interesting to note that no pigs survived a recorded temperature higher than 107.4°F. Table 2 shows the temperatures of six pigs, selected to show examples of the six different grades of reactions referred to.

TABLE 2.

Temperature reactions in pigs with various grades of natural immunity.

Reaction (grade)	Pig No.	Days following inoculation									
		6	7	8	9	10	11	12	13	14	
None	6516	102.0	102.4	101.2	101.6	102.2	100.8	101.2	101.4	101.4	
Slight	6279	101.6	102.0	103.8	101.0	102.0	102.4	101.6	102.2	101.8	
Moderate	5967	103.8	104.0	104.2	104.0	102.4	103.0	101.0	101.6	102.2	
Marked	6507	102.6	103.0	103.0	104.0	105.6	103.0	102.2	103.0		
Severe	5691	104.0	106.0	103.4	104.0	103.2	102.4	102.4	101.8		
Extreme	5687	103.2	107.4	105.0	106.0	102.0	106.0	103.2	103.2		

It is interesting to note that the foregoing temperature reactions very closely simulate those shown by test pigs which have received an injection of virulent virus (usually 2.0 c.c.) simultaneously with various amounts of anti-serum (usually 10.0 to 25.0 c.c.), in the potency tests to which the serum is subjected before its distribution and use. Pigs receiving the larger test doses of serum usually show temperature reactions corresponding to pigs 6516 and

6279, reactions graded as "none" or "slight". Pigs receiving the smaller doses may show reactions corresponding to the other grades, from "moderate" to "extreme", depending upon the relative potency of the serum and virulence of the virus.

IMMUNITY AND SUSCEPTIBILITY ACCORDING TO AGE. In order to determine, if possible, at what size or age, estimated from the weight of the pigs, the maximum and minimum resistance occurred, a study of the weights (at time of inoculation) of the survivors was made. It was found that most of the pigs used weighed between forty and one hundred and ten pounds (40-110 lbs.), with a small number both above and below these limits. The following table will show the pigs grouped according to ten pound limits, showing the number inoculated in each group, the number of survivors, and the percentage.

TABLE 3.

Showing number of survivors in different groups of pigs, classed according to weight.

Weight limits (lbs.)	Number of pigs inoculated	Number failed to succumb	Per cent
21- 30	10	1	10.0
31- 40	32	4	12.5
41- 50	125	10	8.0
51- 60	320	57	17.8
61- 70	498	79	15.9
71- 80	525	75	14.3
81- 90	506	71	14.0
91-100	459	57	12.4
101-110	237	28	11.8
111-120	71	5	7.0
121-140	18	3	16.6
	2800	390	13.9

Leaving out of consideration the pigs which weighed less than forty-one pounds, and those which weighed more than one hundred and ten pounds, there being but relatively few pigs of these weights, it would appear that resistance is lowest in pigs weighing from forty-one to fifty pounds, and greatest in pigs weighing between fifty-one and sixty pounds, with a gradual decrease in resistance being shown by the pigs as the groups increased in weight. Approximately eighteen per cent of the pigs weighing from fifty-one to sixty pounds failed to succumb, whereas only twelve per cent of the pigs weighing one hundred and one to one hundred and ten pounds survived.

We were not surprised to notice the extreme susceptibility of pigs weighing less than fifty pounds. Experience has shown that at this age mortality from cholera is very high, opportunities having been offered for making observations on herds in which cholera had made its appearance in a natural way, and such herds containing pigs and mature hogs of various ages. Even pigs from immune sows are quite susceptible at this age and weight (40-50 lbs.), provided they have been entirely weaned for several weeks. It is believed that such pigs have been protected during the nursing period, probably through the agency of antibodies in the milk. At weaning time this protection (passive immunity) is taken away, and infection follows exposure very rapidly. Several experiences with vaccinating pigs of this age with the double treatment would even lead us to believe that there is a hypersusceptibility at this time, possibly due to the disturbances caused the young pigs incident to the change of feed following weaning.

Very little was known of the history of the great majority of the 2800 pigs represented in this report, but a very large proportion of them were shipped into the South St. Paul stock-yards from points in North Dakota, Montana and Canada. It is highly improbable, except in rare instances, that pigs of the above weights (50-110 lbs.) had been vaccinated previously. Certain local conditions, such as shortage of feed, sometimes necessitates shipping young pigs to market, but the owners and shippers usually do not go to the expense of having pigs vaccinated before shipment. Our buyer knew our wants, and his instructions were to buy Dakota, Montana and Canadian pigs whenever they were available. We believe that pigs from these sources would be more susceptible, would probably not have been exposed to infection or previously vaccinated.

TIME OF APPEARANCE OF HEIGHT OF REACTION. The day on which the height of the reaction took place, following the inoculation with virus, estimated by the highest temperature recorded, has been determined. It would appear interesting to note, in this connection, that a majority of the pigs which failed to succumb apparently reached the height of their reaction twenty-four hours earlier than in the case of the pigs which died or were killed in a more or less moribund condition. Of the 390 survivors, 77 pigs (19.7%) showed a maximum temperature on the sixth day. On the other hand, a series of 390 consecutive pigs which died or were

killed showed 78 pigs (20.0%) with highest temperatures on the sixth day, but 149 pigs (38.2%) with the highest temperature on the seventh day, and 69 pigs (17.7%) on the eighth day. These facts are set forth in tabular forms as follows:—

TABLE 5.

Showing days after inoculation when maximum temperatures were recorded in the 390 survivors, compared with 390 consecutive fatal cases.

Day of maximum temperature	Pigs that failed to succumb		Pigs that died or were killed	
	Number of Pigs	%	Number of Pigs	%
4	8	2.1	1	0.2
5	38	9.7	38	9.7
6	77	19.7	78	20.0
7	53	13.6	149	38.2
8	54	13.8	69	17.7
9	51	13.1	25	6.4
10	26	6.7	17	4.4
11	33	8.4	4	1.0
12	16	4.1	6	1.6
13	16	4.1	0	0.0
14	7	1.8	2	0.5
15	5	1.3	0	0.0
16	6	1.6	1	0.3
Totals	390	100.0	390	100.0

These observations coincide very closely with those reported by Craig and Whiting¹, on the temperature curves drawn from the temperature records of 900 pigs used for testing serum or vaccinated by the double method. The average daily temperatures show the highest on the sixth day. In another series of 250 pigs, inoculated with hog cholera virus, which died or were killed between the seventh and fourteenth days, a temperature curve drawn from the temperature records shows the highest average temperature on the seventh day.

MAINTENANCE OF VIRULENCE OF HOG CHOLERA VIRUS. The maintenance of a strain of hog cholera virus of maximum virulence is of the greatest importance in the production of highly and uniformly potent anti-hog cholera serum. In a general way the virulence of the virus is reflected in the potency of the resulting anti-serum. In our work we aimed to keep only one strain of virus going, although other workers have attempted to keep a number of strains going. Our serum was prepared for use in a limited territory (Minnesota) and the reasons advanced for using a number of strains of virus, principally to produce a polyvalent serum, did

not seem necessary as long as our strain of virus did not show any signs of weakening, and the field results with the serum continued to be satisfactory.

On the other hand, it is doubtful whether it is possible to keep a given strain of hog cholera virus pure, under conditions usually met with in serum plants, on account of the extremely contagious nature of the virus. It is not a practical proposition, except for purely experimental purposes, where the item of expense can be forgotten.

Nevertheless it would appear that we succeeded fairly well in keeping our strain of virus up to a degree of extreme virulence, really the most important point after all, when it was possible to make frequent passages through susceptible pigs. At the time this particular strain of virus had just gone through its 120th passage, claim was made² that it was as near to being a fixed virus as it would be possible to get it. At the time this paper is being prepared it is going through its 137th passage. The problem of a fixed virus is discussed later in this paper. Briefly, our plan was to select a pig from each group inoculated, a pig that showed an early and marked reaction to the injection of 2.0 c.c. of seed virus, usually made intramuscularly. The animal was killed by bleeding from the throat, as aseptically as possible, the blood defibrinated, and then placed in a refrigerator. A careful autopsy would then be held on the pig, and if undoubted lesions of hog cholera were found, however slight, and not contaminated with any other infection, as far as macroscopical examination showed, a part (usually about 250.00 c.c.) of the blood was reserved and divided into two portions. One portion was preserved with a 0.5% phenol solution, while no preservative was added to the other. The virus was then placed in sealed containers and kept in a refrigerator at about 4°C. until used.

In a number of instances, when frequent passages of the virus were not made, there was an apparent decrease in virulence noticed in the unpreserved sample, when used for inoculation purposes. The preserved sample of the same passage, in most cases, did not lose its virulence so rapidly as the unpreserved portion. This is thought to be due to the growth and action of the organisms contaminating the unpreserved sample. However, as long as the latter remained "sweet" (absence of putrefactive odor), the virus usually proved to be of satisfactory virulence. Although phenol as a pre-

servative in strengths as high as one per cent will not destroy the hog cholera virus, our reasons for attempting to keep virus without a preservative were simply along the line that the phenol might possibly attenuate the virus, if only to a slight degree, which was undesirable if it could in any way be prevented.

EFFECT OF AGE ON VIRULENCE OF SEED VIRUS. The length of time that virus would remain virulent under the most favorable conditions was variable. In a few cases where tests were made to determine this point, the virulence did not seem to have been lost after several months storage in the refrigerator under the conditions already named. Table 6 gives the results of two of the tests.

TABLE 6.

Experiments to determine the effects of age on the virulence of hog cholera virus.

Virus No.	Age-days	Pig No.	Wgt. lbs.	Date inoc.	Max. temp.	Day	Outcome Days	Average		Inc. Dec.*
								Old	Fresh	
110	216	7434	49	11-17-15	105.0	9	D 17	20.0	8.6	—11.4
110	216	7435	30	11-17-15	105.2	8	D 23			
120	131	7433	55	11-17-15	106.8	8	K 9	9.5	8.6	—0.9
120	131	7443	32	11-17-15	106.4	9	K 10			
124	93	7438	45	11-17-15	107.0	9	K 9	10.0	8.0	—2.0
124	93	7440	30	11-17-15	105.0	10	K 11			
125	80	7442	54	11-17-15	107.2	8	K 10	10.5	7.5	—3.0
125	80	7444	32	11-17-15	107.4	10	K 11			
126	68	7437	58	11-17-15	106.2	9	K 9	8.5	7.5	—1.0
126	68	7439	40	11-17-15	106.8	7	K 8			
126	162	7617	52	2-19-16	105.2	5	K 6	8.0	7.5	—0.5
126	162	7637	48	2-19-16	105.8	7	D 10			
127	37	7432	44	11-17-15	107.0	7	K 10	10.5	8.0	—2.5
127	37	7436	25	11-17-15	105.8	8	K 11			
127	132	7639	53	2-19-16	106.4	7	K 7	7.0	8.0	+1.0
127	132	7625	50	2-19-16	106.0	7	K 7			
128	7	7431	59	11-17-15	109.6	8	K 8	8.0	8.7	+0.7
128	7	7441	42	11-17-15	107.4	7	K 8			
128	102	7627	50	2-19-16	106.2	7	K 7	9.5	8.7	—0.8
128	102	7622	67	2-19-16	106.2	8	K 12			
129	49	7642	52	2-19-16	108.2	7	K 11	11.5	13.0	+1.5
129	49	7632	72	2-19-16	106.4	7	K 12			

*Increase or decrease in virulence, expressed in days. —loss; +gain.

EFFECT OF INJECTIONS OF VARIOUS AMOUNTS OF VIRUS BY DIFFERENT METHODS. The amount of virus injected, or the manner of introduction into the body of the pig, seemed to be no factor in the appearance of symptoms following inoculation. Two cubic centimeters would invariably bring a pig down as soon as ten cubic centimeters, and intravenous injections did not seem to shorten the incubation period, when compared with intramuscular or subcutaneous injections made with the same virus, at the same time, on pigs in the same group. A few of these experiments are shown in Table 7.

TABLE 7.

Experiments to determine the effects of the injection of different sized doses of hog cholera virus, subcutaneously and intravenously.

Pig No.	Wgt. lbs.	Date Inoc.	Virus No.	Amt. c.c.	X	Highest temp.	Day	Outcome
5301	76	3-31-15	108	2.0	S	103.4	8	Remained well
5302	46	3-31-15	108	10.0	S	103.4	10	Remained well
5303	78	3-31-15	108	2.0	S	107.0	7	Killed 7th day. Cholera
5494	66	4-12-15	110	2.0	S	106.4	8	Killed 9th day. Cholera
5495	52	4-12-15	110	5.0	S	106.8	9	Killed 9th day. Cholera
5611	65	4-18-15	111	3.0	S	106.2	7	Killed 8th day. Cholera
5617	72	4-18-15	111	5.0	S	107.0	6	Killed 8th day. Cholera
5621	62	4-18-15	111	3.0	S	107.0	9	Killed 9th day. Cholera
5624	75	4-18-15	111	5.0	S	106.6	9	Killed 9th day. Cholera
5755	55	4-23-15	112	5.0	S	106.2	6	Killed 9th day. Cholera
5759	57	4-23-15	112	5.0	I	105.6	7	Died 9th day. Cholera
5760	55	4-23-15	112	2.0	S	106.6	8	Killed 9th day. Cholera
5761	63	4-23-15	112	2.0	S	107.4	7	Killed 8th day. Cholera
5762	65	4-23-15	112	5.0	I	106.4	7	Killed 9th day. Cholera
5765	67	4-23-15	112	10.0	I	105.8	6	Sick 3 days. Recovered
5768	62	4-23-15	112	2.0	S	106.4	8	Killed 9th day. Cholera
5770	53	4-23-14	112	2.0	S	104.6	8	Sick 3 days. Recovered
5888	55	4-28-15	112	1.0	S	106.6	8	Killed 9th day. Cholera
5893	74	4-28-15	112	10.0	S	107.6	9	Killed 9th day. Cholera

x S—subcutaneously. I—intravenously.

FIXED VIRUS OF HOG CHOLERA. The problem of obtaining a fixed virus of hog cholera is one attended with a number of difficulties. Reichel³ was the first to suggest the possibilities, as well as the desirability of such a virus, while the writer⁴ has already pointed out some of the difficulties of the problem. One of the greatest difficulties to meet and overcome, perhaps, is the fact that hog cholera is an infection that is very frequently complicated, a number of organisms of varying degrees of pathogenicity playing a part in the disease. This is not so true of a disease like rabies,

at least in the light of our present knowledge, a fixed virus of rabies being obtainable by a number of frequent, successive passages through rabbits, and secondary infections appearing to play little or no part in the disease itself.

In the production of anti-hog cholera serum, the virus pigs are usually killed in a more or less moribund condition, and not allowed to die, when death can be anticipated. Here the personal factor enters into the problem, and there is not a little divergence of opinion on the question as to when the sick virus pig is in the best condition for bleeding, in so far as the virulence of the virus is concerned, its concentration, the amount to be obtained per pound of body weight and its relative freedom from large numbers of organisms of the class of secondary invaders.

The sicker the pig, the greater the chance for the blood stream to be entered by these secondary invading organisms, most of them undoubtedly coming from the intestinal canal. They easily gain entrance to the circulation due to the weakened condition of the pig and the lowered resistance offered by the relaxed tissues. This is an important point, already briefly touched upon, when the blood is to be used for hyperimmunization purposes, due to the danger of producing a bacteriemia in the hogs receiving intravenous injections of from one to two litres of the defibrinated blood.

Table 8 shows a summary of one passage of our virus. Three lots of pigs (45 pigs in all) were inoculated with 2.0 c.c. of seed virus No. 80, each of the three lots being inoculated on different days. Six pigs proved to be non-susceptible, while one pig died from causes other than hog cholera. The remainder (38 pigs) either died or were killed about the eighth day (average 8.1 days). Summaries of the other passages made during 1914 and 1915 (60 in all) showed slight variations, of course, passage No. 80 being selected as typical.

TABLE 8.
Summary of a passage of hog cholera virus.

PASSAGE No. 80						
Lot No.	No. Pigs	Date inoc.	No. immune	D. or K. cholera	D. or K. other causes	Average Days
44	8	5-23-14	2	5	1	8.4
45	20	5-26-14	2	18	0	7.8
46	17	5-28-14	2	15	0	8.1
Totals	45		6	38	1	8.1

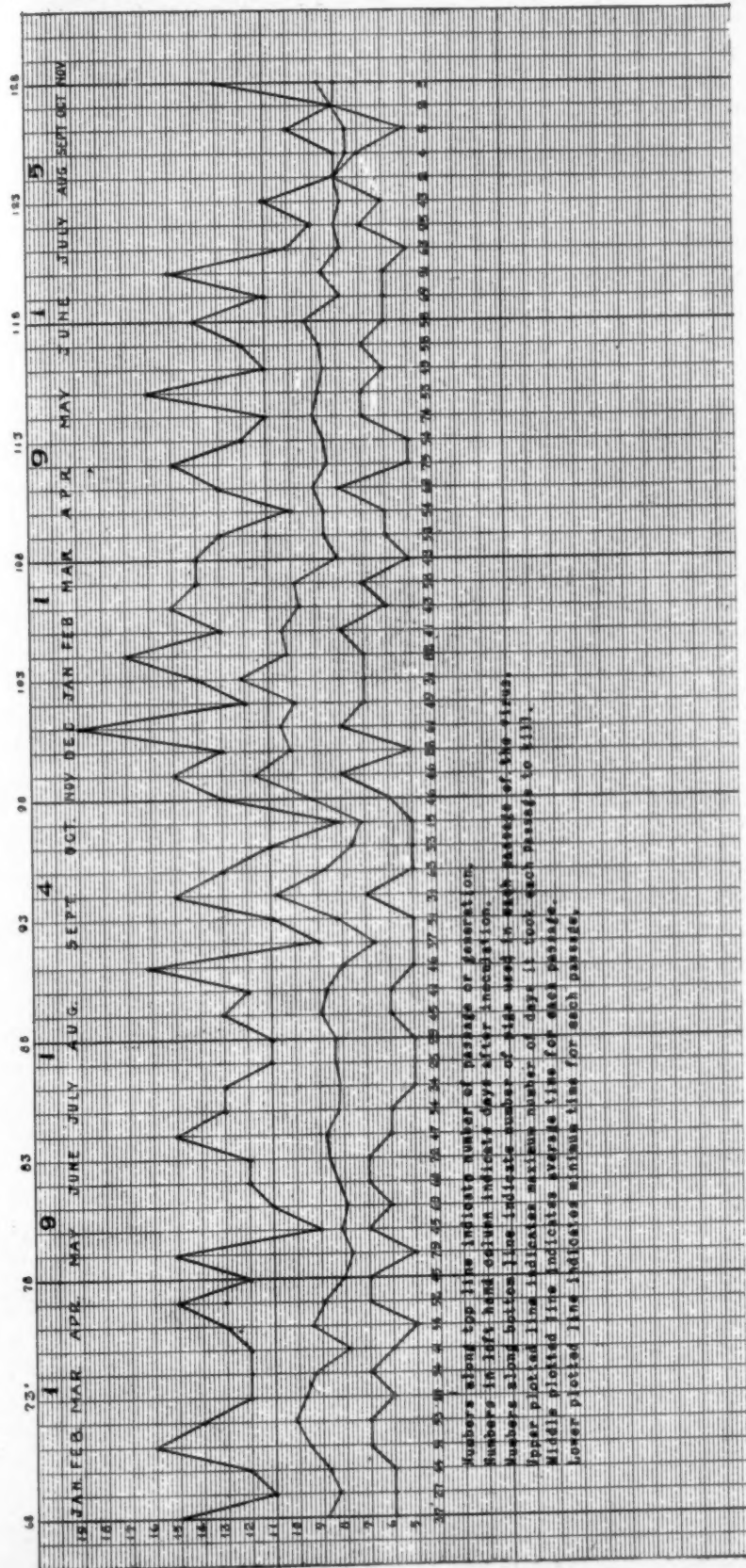


CHART 1. Showing variations in virulence of a strain of hog cholera virus, through 60 passages (generations), extending over a period of two years, 2410 pigs having been used during this time. The 390 pigs which failed to succumb are not considered in computing the averages.

The accompanying chart (No. 1) shows that the majority of the 2410 pigs were killed on the eighth or ninth day after inoculation. The virus obtained was used for hyperimmunization purposes at the rate of five to six cubic centimeters per pound body weight, and the resulting serum proved to be quite uniformly potent, when the hyperimmunes were bled on the eleventh, eighteenth and twenty-fifth days following hyperimmunization, and the serum subjected to the standard test of the Bureau of Animal Industry.

The middle line in the chart is the average number of days after inoculation before the pigs died or were killed, all pigs inoculated with a certain passage of virus being placed in one group, and the number of pigs in such groups varying from 2 to 91. The upper line is the maximum number of days in each such group, and the lower line is the minimum number of days in which a pig was killed from each group. If a pig was killed or died later than the nineteenth day, it is not included. Likewise, pigs dead or killed before the fifth day are excluded, on account of the probability of prior infection or some other cause for death.

ACKNOWLEDGMENT. The author takes this opportunity to thank Dr. H. C. H. Kernkamp, who was associated with him for about eighteen months of the time covered by this report, and Dr. J. T. E. Dinwoodie, also associated with him for about nine months, for valuable assistance rendered in making inoculations, holding autopsies and recording the lesions found.

SUMMARY. 1. Of 2800 pigs inoculated with a virulent strain of hog cholera virus, 390 (13.9%) failed to succumb to the infection.

2. Reactions shown by the inoculated pigs which failed to succumb, varied between wide limits, indicating all grades of susceptibility and immunity to hog cholera.

3. No pigs survived a temperature higher than 107.4°F.

4. Pigs weighing between 40 and 50 pounds showed greatest susceptibility, only 8% of the pigs inoculated at this weight surviving.

5. Pigs weighing between 50 and 60 pounds at the time of inoculation apparently showed the greatest resistance, judged by the percentage which failed to succumb, resistance slowly decreasing as the pigs became heavier.

6. Pigs which failed to succumb reached the height of their reaction (temperature) most frequently on the sixth day.

7. Pigs which died or were killed when moribund reached the height of their reaction most frequently on the seventh day.

8. By frequent passages of a strain of virus through susceptible pigs, and carefully selecting the seed virus pig from each group, a virus has been obtained which can be depended upon to bring pigs down on the eighth day with a fair degree of regularity.

9. Pigs inoculated with virus of different ages, up to 162 days, succumbed quite regularly, within a few days of the time necessary for the same virus to bring the pigs down when comparatively fresh.

10. Virus 216 days old had apparently lost its infectivity.

11. Pigs inoculated with varying amounts of virus (1.0 to 10.0 c.c.) came down in the usual length of time, regardless of the amount injected or the manner of introduction.

CONCLUSIONS. 1. On the average it is safe to assume that about 14% of pigs weighing between 40 and 140 pounds have sufficient natural immunity to resist fatal infection with virulent hog cholera virus. This fact should be kept in mind in all experimental work with hog cholera, especially the testing of anti-hog cholera serum, and conclusions should not be drawn from experiments made on a small series of pigs.

2. Pigs appear to be most susceptible during the period between weaning time and when they reach about 50 pounds in weight. Pigs of this size, however, are not economical for routine virus production. Pigs as heavy as 120 pounds show as great a degree of susceptibility as the younger pigs, according to our observations.

3. Virus pigs will usually show the height of their reaction at or about the sixth or seventh day. For some unexplained reason the pigs which failed to succumb reached the height of their reaction a day earlier, on the average, than those pigs which died or were killed. It may be that the reaction to the filterable virus occurred before the pig was sufficiently weakened to invite the invasion of secondary organisms from the intestinal canal, in which case recovery followed.

4. With certain restrictions attached to the meaning of the term "fixed virus", such a virus for hog cholera may be obtained by frequent passages through susceptible pigs, the number of such pigs being large enough to allow considerable choice in selecting the seed virus pig from each group.

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FURTHER STUDIES IN X-RAY DIAGNOSIS IN VETERINARY MEDICINE*

LOUIS GRIESSMAN, New York City.

At the last convention I gave a brief outline of the history, development, diagnostic and therapeutic value of the X-ray as it is used in veterinary medicine and surgery. Detailed experiments and especially studies in tuberculosis and glanders of the larger animals were difficult to undertake because of lack of material. Work of such tremendous importance must be financed by and performed under the auspices of the state, by veterinarians who are competent and able to use and understand the X-ray. The state does not permit, nor is it practical for veterinarians, to keep the larger tubercular animals in the laboratories in the center of the city. Such work, however, would be invaluable to the state and not only could plates be taken of suspected animals and kept under observation, but the progress of the lesions could be noted and recorded on the plates at stated intervals.

For the radiographic examination of the larger animals we need a more powerful apparatus than that of the kind ordinarily used in the examination of such parts, as the hip and the stomach. The fluoroscopic examination of the lungs of a horse or cow, for example, is comparatively simple, although the distance to penetrate is great, the density is little. The X-ray apparatus may even be taken into the field at any distance from the source of electrical supply, and then connected to an automobile for its motive power; a detailed description of how to hook up an X-ray machine to the hind wheel of an automobile is described in a recent number of the *Journal of the American Medical Association*.

Let us turn for a moment to some of the average cases met with in general practice where roentgenology is invaluable. In order to determine whether a fracture is well set, it is necessary to take two views at right angles to each other; for although the antero-posterior view may show that the fragments are apparently in correct alignment, the lateral view may show overlapping of the bones. This cannot be determined in any other way.

*Presented at the meeting of the New York State Veterinary Medical Society, Ithaca, N. Y., August 3, 1916.

In the examination for foreign bodies, the antero-posterior view will show the shadow of the foreign body, but it will not show its depth. Therefore, it often becomes necessary both in the examination for foreign bodies and for fractures to make a stereoscopic set of plates. In order to do this, two plates are made, the plates are put into the plate holder in exactly the same position and exposed one immediately after the other; the tube, however, is shifted one and a half inches to the right of the median line for the first plate and one and a half inches to the left of the median line for the second plate. The total tube-shifting is therefore three inches, which is the distance between the two pupils of the eyes. The plates are then, after having been developed and dried, put into a Wheatstone Stereoscope and on examination are found to give three dimensions or the value of depth. This method is also very valuable to determine the direction of a sinus which is so tortuous that it cannot be probed. In this type of case a bismuth paste is injected into the sinus and a stereoscopic set of plates will determine its position in space and whether or not the sinus reaches the bone. An ordinary flat projection would show the sinus shadow superimposed upon the bone shadow.

The study of bone lesions requires plates which show not only the morphology of the bone, but they must also show good bone detail or structure. In the smaller animals we must have a soft tube for this type of work. One study was made along these lines after an experimental fracture of a chicken's femur. It was noted when the fragments were corrected a large amount of callus was deposited as early as the fifth day. After the callus is deposited, it takes a considerable length of time, from three to four weeks before the black line (callous line) between the fragments disappears. As long as this line persists, it would be unsafe to remove the cast and the roentgenogram therefore serves as an indicator as to when union is completed.

Another type of studies was made in the following manner: this consists in the study of the uterus and urinary bladder. The only way in which to visualize the urinary bladder and the uterus is by injecting some opaque innocuous fluid as the salts of a heavy metal. Since the density of the shadow varies with the atomic weight of the obstruction, we use a ten per cent solution of collargol, a silver preparation, or a solution of thorium nitrate, which ful-

fills the the requirements. The latter is preferable, as it is transparent and does not cause stains.

Technic: One to two ounces of a ten per cent solution of col-largol or thorium is injected into the bladder through an urethral catheter, a plate is then made with the solution *in situ* and any polyp or other tumor growing into the bladder is therefore visualized and thus we may also see malformations of the bladder as a diverticulum or an abnormality in the size of the bladder.

This now brings our studies to the gastro-intestinal tract. By the use of the Roentgen ray we can visualize the lumen of any part of the gastro-intestinal tract.

Technic: The dog or other animal is given two ounces of bismuth subcarbonate or barium sulphate in milk or in porridge; then several plates are made in the antero-posterior and lateral position. A plate or fluoroscopic examination is then made every hour for six hours. The diagnosis is then dependent on the presence of defects, the amount of peristalsis and the rate of emptying.

Numerous experiments have been made along the lines above indicated, but the work can only be done as the material presents itself. Nor can it be done indiscriminately because of the expense involved. Let me again call your attention to the tremendous value of this work, and the absolute necessity that the state or some endowment create a fund which will finance this work and what is just as important, it should supply suitable animals for the study of the disease in the living.

The following pictures will illustrate the points mentioned in this paper.

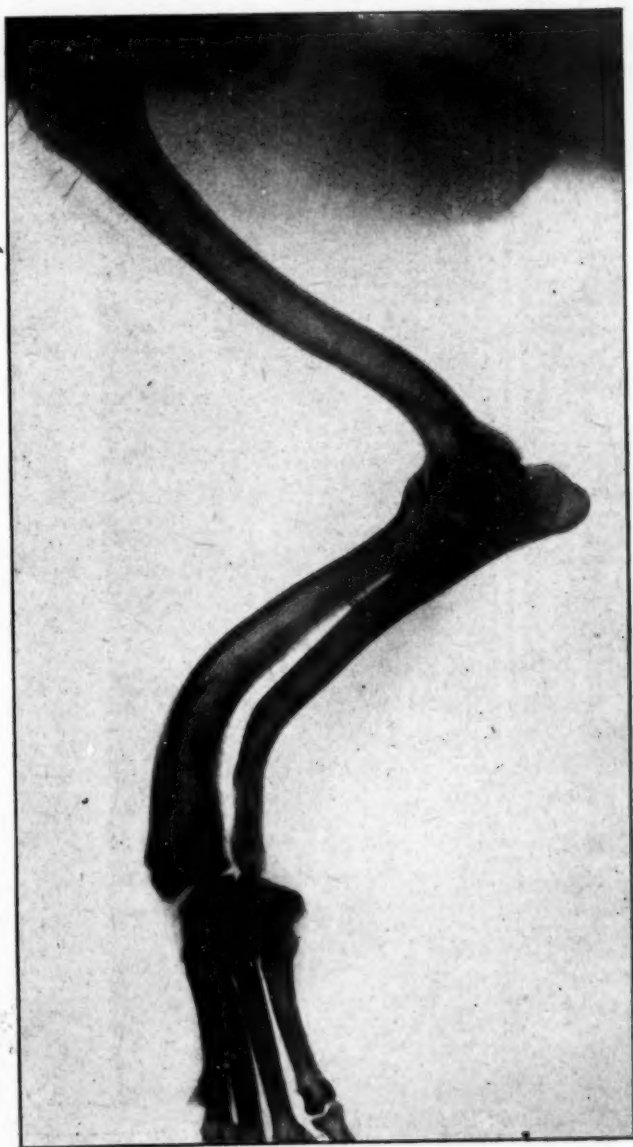


FIG. 1.
Malformation of bone. (congenital).

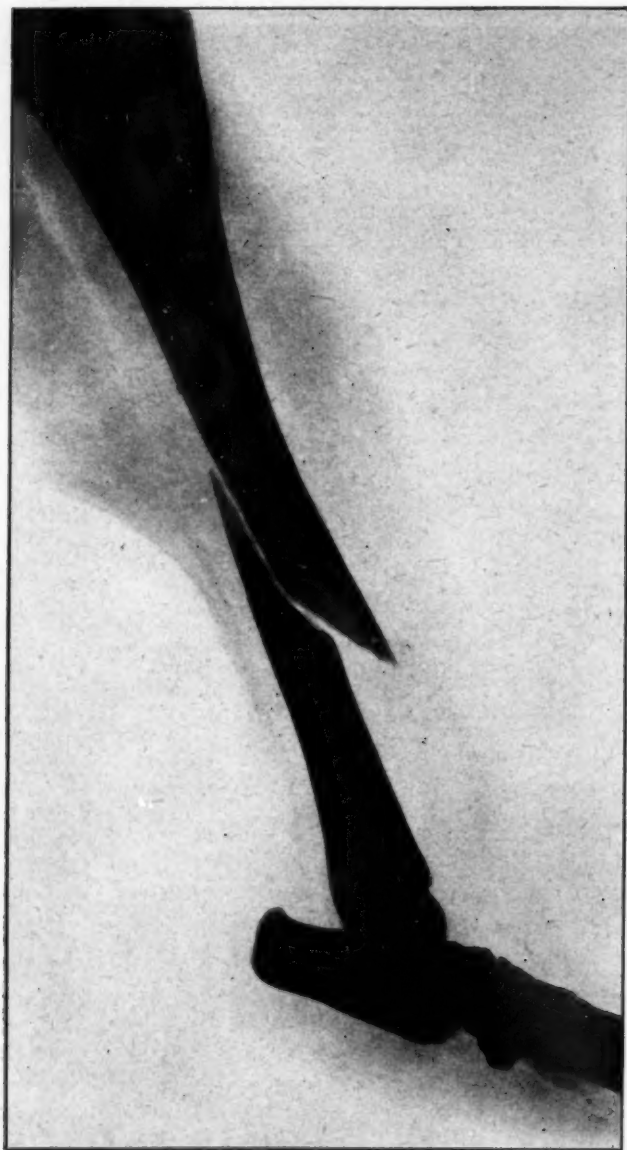


FIG. 2.
Fracture of tibia in dog.



FIG. 3.

Bullet and amputation of left leg in dog showing periostitis of end of bone.

THE REQUIREMENTS OF THE PHYSICAL EXAMINATION OF DAIRY CATTLE IN ACCORDANCE WITH THE REGULATIONS OF THE STATE AND CITY CODES*

A. SILKMAN, New York City.

Among the rules and regulations that have been adopted by the Board of Health for the production and sale of milk other than Grade A Raw, is the following:—

“Only such cows shall be admitted to the herd as have been physically examined by a regularly qualified veterinarian and declared by him to be healthy and free from tuberculosis in so far as a physical examination may determine that fact. Such an examination of all cows shall be made at least once a year.” A physical examination of dairy cows shall consist of the following procedure:

1. General condition of each cow as a whole.
2. Commencing on one side of a cow examination shall include:
 - a. The submaxillary glands
 - b. The retropharyngeal glands
 - c. The prescapular glands
 - d. The auscultation of the left lung
 - e. The precrural glands
 - f. The supermammary lymph glands
 - g. Lift the tail and examine for any purulent vaginal discharges
 - h. Palpate the udder
3. Going on the other side of the cow, conduct in reverse order an examination similar to that under preceding clause.
4. If anything is found to be wrong in the physical examination as above given, the temperature is to be taken and other details gone into thoroughly, such as sampling the milk, etc.

I appreciate the honor that has been bestowed upon me in asking me to address you where there are so many able men whose

*Presented at the meeting of the New York State Veterinary Medical Society, Ithaca, N. Y., August 3, 1916.

practice along these lines has made them more or less expert. It is not easy to make a correct diagnosis, nor is the following of a set rule always productive of satisfactory results. I have for a long time been intimately connected with this class of work, and am conscious of the fact that a veterinarian who is in close touch with this branch of his profession, diagnoses not always by rule or by positive signs, so called, but often by a sort of intuition, which comes from long practice and association with these cases. The ordinary practitioners frequently pass by some of these cases without discovering the existence of tuberculosis. For this reason, it is wise to depend only upon the best expert examiner, for he does not speculate nor guess. He knows.

I am advised that Drs. Moore and Udall are carrying on research work and testing out the use of the sputum cup in making clinical examinations in conjunction with physical examinations, and this work should be watched with interest by veterinarians. These men are clever and conscientious, and if their work should prove successful, it is hard to estimate the great economic value of their efforts.

SUGGESTION. The certificates that are sent in to the Department of Health by veterinarians of their examinations, simply state that they have examined so many cows and find them free from any symptoms of tuberculosis or any infectious disease. Would it not be better for the veterinarians to have certificates with the names of all superficial glands printed in, and which could be checked off as having been examined? This would show that a careful examination had been made.

It is reported that through shipments of Dipped Cattle from Jacksonville, Fla., is now possible, under federal inspection, when the shipment is large. This results from the building of a large dipping vat and non-infectious pens, and materially assists Florida in her trade relations with other states.

Every member of the 1916 graduating class at the veterinary college at Ames, Ia., has gone into practice save one. The one exception has been granted a fellowship at the Rockefeller Institute for Medical Research at New York City.

Dr. William Killough of Elk City died of brain trouble at the home of his parents at Ottawa, Kans.

CLINICAL AND CASE REPORTS

“Knowledge is born in laboratories and in the experience of the thoughtful. It develops form in the journals and ‘when dead it is decently buried in books’.”

FOREIGN BODIES IN THE DIGESTIVE TRACT OF BOVINES

J. M. CURRIE, Rome, N. Y.

The presence of foreign bodies in the digestive tract of the bovine family occurs more frequently than I at one time supposed. It is a well known fact that animals of this class are careless about their eating; masticating coarsely and swallowing rapidly all food. They often swallow nails, sack needles, pieces of wire, corset steels, fence staples, pieces of wood, bone, etc. If these objects pass through the oesophagus and reach the stomach and remain there, they do not as a rule seem to do any harm, but if by chance they should pass on and enter the intestines, they are apt to become intercepted, in making the curves, the point becoming imbedded in the mucous membrane and by pressure from behind and the natural muscular action of the intestine, they puncture the walls and enter the abdominal cavity, and if the object be a common nail the head will prevent it from passing entirely free from the intestine, then the trouble begins. Perhaps a small amount of ingesta may pass with it and by the action of the intestine wafting it to and fro an acute peritonitis sets in causing death. Post-mortem reveals the above mentioned inflammation with considerable serous fluid and some coagulum; the foreign body is readily recognizable.

The most common course in my experience has been for these objects to puncture the wall of the reticulum and travel through the diaphragm toward the heart, causing pericarditis and death in a few days; but I have known a case to linger two weeks from the time the first symptoms developed.

In an ordinary case the cow stops eating and from her general appearance might be suspected of having indigestion. She looks full over the region of the rumen; refuses to eat or drink; rumination ceases, etc.

A cathartic is now administered followed by whatever line of treatment is deemed most advisable. In a couple of days she will

very likely show an inclination to eat a little. There is some encouragement but improvement is of short duration. The early symptoms return with some additional ones: such as hurried breathing; sometimes elevation of temperature; a distressing grunt, which is modified by standing the animal with her forward feet six or eight inches higher than the hind ones and intensified by standing in the opposite position; anxious expression of eye; not much evacuation from the bowels, etc. Auscultation reveals a condition similar to hydro-thorax but more localized over the heart region. At about this time an edematous swelling will appear in the submaxillary space gradually increasing in size and extending down to the inferior cervical region, sometimes as far back as the posterior part of the sternum to the abdomen. At about this time all symptoms intensify and death soon follows.

Autopsy usually reveals all organs in the abdominal cavity normal, but from the diaphragm anteriorly there seems to be a line of indurated new tissue extending to the pericardium, which is often much distended. Upon opening the same a large amount of foul smelling serum, pus and coagulum escapes. The heart itself looks like a misshaped mass of granulating tissue of a whitish-yellow color. Usually one of the above mentioned sharp objects is found in close proximity to the heart.

Another condition which I have witnessed was the puncture by a piece of copper wire four inches long through the mucous membrane of the rumen imbedding itself between that and the muscular walls, causing an abscess as large as a man's head, revealed on post-mortem.

If these cases could be correctly diagnosed early, slaughter of the animal should be advised and the carcass passed for food.

Along the line of an early diagnosis I am in hopes that some genius with an inventive turn of mind may perfect an apparatus of the X-ray order, which will be reasonable in price, practical and applicable to viewing the innermost recesses of animals as large as an ordinary cow, so that we might early advise our client of existing conditions and that the animal might be disposed of in such a manner that practically no loss might occur.

A post-mortem should be held whenever opportunity presents itself. Many unsuspected conditions are revealed which otherwise would remain veiled in mystery. In the last three years I have found the objects above mentioned in as many as fifteen cases, of which I could not have been positive without so doing.

PUNCTURE OF ABDOMINAL CAVITY

T. O. BRANDENBURG, Lakota, N. D.

Large Clydesdale mare, heavy in foal, age about eight years and used on one of our North Dakota farms as work animal and brood mare.

A fork was accidentally left in her stall one night and in the morning the owner discovered it run in the full length of the tines (about 10 inches.)

I was called at once and found the following condition: the fork had been removed and examination showed the fork as entering the abdomen below the twelfth rib right side and running directly inward and slightly posteriorly. The mare was in a very excitable condition and showed considerable pain, serum dripping from two of the openings, pulse 65 and respirations shallow and rapid, the fetus was jumping about a great deal but it was impossible to determine whether the uterus had been punctured. From the location it appeared probable.

Treatment:—Sedative of chloral hydrate, one ounce. Polyvalent bacterin.

Five days later examination showed a temperature of 104.5 and pulse 70. Polyvalent bacterin in double dose. Five days later animal was in nearly normal condition as to pulse and temperature and about two months later gave birth to a very nice colt but suffered with retained placenta.

The mare has showed no effects of the accident, except occasional slight pain from adhesions.

DROPSICAL UTERUS AND RACHITIS OF FETUS

T. O. BRANDENBURG, Lakota, N. D.

Grade Shorthorn cow, four years old and a splendid milk animal. During the previous winter months she had been fed very coarse feed, consisting mostly of straw and a little grain and had during that period become rather emaciated. However, due to the rich spring pastures, she had gained in flesh and the abdomen had become enormously distended for a month previous to calving and had gradually enlarged as parturition time neared.

Labor, accompanied by a great flow of very thick gelatinous fluid slightly solidifying when exposed to air and of a peculiar odor, (estimate of 20 gallons.)

Examination showed an emaciated fetus, posterior presentation, lateral position, all limbs flexed and all joints enlarged and ankylosed.

Delivery was accomplished by breaking the hind limbs in tarsus and pelvis. This was easily done as the bones were very brittle and broke easily in the epiphysis.

Calf weighed about 75 pounds, all joints ankylosed, lateral and posterior curvature of the spine and lateral curvature of the neck.

The cow made an uneventful recovery.

Diagnosis:—Rachitis of the fetus and dropsical condition of the uterus.

HYDROCELE IN A YEARLING BULL

R. S. HEER, Platteville, Wis.

One of the most interesting cases that came to my attention during the past year was that of a pure-bred Guernsey bull owned by Charles Wilkins. First inspection revealed a very large hydrocele of the left scrotal sac, the scrotum extending below the hocks. After making a careful examination, I concluded that aspiration of the fluid would be the proper procedure, so I disinfected the skin of the scrotum and introduced a horse trocar and canula. A large quantity of bloody fluid was withdrawn. Following the aspiration, I injected a 25 per cent solution of fluid extract of thuja.

Ten days later I was called again and found the scrotum as large as ever, but a great deal harder. I again introduced a trocar, but this time the contents of the scrotum were so thick and flaky that only a small amount came away through the canula. I then made an incision large enough to admit one finger and found the entire left scrotal sac lined with a tough membrane about an inch in thickness. A large quantity of a thick flaky fluid resembling the contents of a neglected hygroma of the withers was present. I enlarged the scrotal incision, so that it would admit my hand, and then proceeded to remove the mass of tissue, which seemed to be of a fibrous nature. After all the diseased tissue had

been removed, the scrotum was flushed with Lugol's solution, then packed with sterile gauze, which was left in for twenty-four hours.

The subsequent treatment consisted of a daily flushing with a 1:2000 bichloride solution. In four weeks the scrotal wound was healed. At the end of that time the scrotum had regained its normal size and shape.

Eight months later the Wilkins herd was tuberculin tested and this bull reacted to the test. I am inclined to believe that the hydrocele was due to tuberculosis of the testicle, or its appendages.

—*Proceed. Wis. Vet. Med. Ass'n.*

STRICTURE OF THE ESOPHAGUS

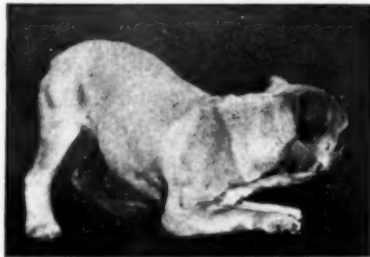
L. A. WRIGHT, Columbus, Wis.

Some time in November we were called to see a two-year-old colt that had received a peculiar injury. The farmer was breaking the colt to halter when he threw himself backward against the sharp end of a board on a broken partition. It caught him in the region of the throat, severing the jugular vein and evidently injuring the esophagus. The vein was picked up and ligated and the wound healed nicely and all went along fine for about a month, when we were again called to relieve him this time of a choke. We failed in our attempts at the farm, so had him brought to the hospital. It was decided that there was a stricture of the esophagus and that an operation would be necessary. The stricture was so complete that it would not admit the passage of an ordinary horse catheter down the gullet. We cut down upon the esophagus and found a heavy band of cicatricial tissue encircling it. This band was divided in several places and then it was possible to pass a stomach tube and later an ordinary probang. The colt was able to drink liquids but unable to swallow any solid foods. Just at this time the owner decided that he did not care to go to any more trouble and expense, with so little prospect of a complete recovery, so we destroyed the animal.—*Proceed. Wis. Vet. Med. Ass'n.*

CONGENITAL LUXATION OF THE RADIO-ULNAR-HUMERAL JOINT.

E. A. WESTON, B.V.Sc., University of Western Australia.

The pup walked in the position shown in the picture, with the leg from the elbow downwards on the ground. The external condyle of the humerus rested on the internal glenoid cavity of the radius and the external cavity was displaced outwardly. The beak of



the olecranon process of the ulna rested on the depression on the outside of the humerus from which the external lateral ligament arises. The bone was thus rotated outwards and the joint immobile. The condition was not diagnosed during life, the impression given on examination being that of ankylosis with bony exostoses.

The State Veterinary Medical Association of South Dakota held its meeting in July at Mitchell, S. D. The association took action towards prosecuting illegal practitioners. A clinic was also held. The association was organized last winter at Huron as an outgrowth from the old association. About 60 veterinarians were in attendance. The officers are as follows: President, Dr. John L. Barber of Tyndall; Secretary, Dr. C. R. Andrew of Huron; Treasurer, Dr. O. C. Shepard of Centerville.

The Minnesota State Veterinary Medical Association at its meeting in Minneapolis passed a resolution recommending that the Board of Regents appoint a "Veterinary pathologist" "who will direct the work of the division, especially along the lines of research with animal diseases."

ABSTRACTS FROM RECENT LITERATURE

MILK FEVER FOUR MONTHS AFTER CALVING. R. W. Knowles, M.R. C.V.S. *Veterinary Record*.—This case is recorded because of the unusual length of time elapsed since parturition had taken place. The cow had calved some four months since when she was taken ill. Down, unable to rise, cerebral symptoms, champing of the mouth, and flow of saliva, suggested to the writer that the case was one of simple hysteria, for which he prescribed sulphate of magnesia and chloral hydrate. The next day the animal was worse: helpless, unconscious, moaning, lower jaw dropping, in fact, typical manifestations of milk fever. The regular inflation udder treatment was immediately applied, with the application of cold compresses to the head. Four hours after the cow was up, and has been well ever since.

LIAUTARD.

GREEN DISCOLORATION OF THE BONES OF A SHEEP. E. Messner. *Deutsche Tierärztliche Wochenschrift*, Vol. 23, pp. 389-390, 1915. A butcher found a sheep in which all the bones were colored green. The bones and adherent meat were of the size, odor, shape, etc., normal to sheep. On longitudinal and cross section, the radius was green throughout the innermost layer of the compact bone substance. In spots the coloration extended to the spongy substance. The colored layer was on the average, 1 mm. thick. In the distal half of the femur the green coloration was found as a layer, 1 mm. thick, under the inner surface of the compact substance. On cross section of the femur, the layer appeared as a ring.

Jaundice was absent. The meat inspectors examined and passed the carcass.

Microscopic examination of thin bone sections taken from the colored areas showed a diffuse distribution of the coloring matter; a granular deposition of the coloring matter was not noted, although looked for.

The green color was soluble in hydrochloric acid. Chemical tests showed that the color was due to iron. Fresh, normal sheep bones when similarly extracted with hydrochloric acid gave no stronger tests for iron than the acid itself.

On searching the literature nothing similar to the above condition was found. Beel (*Zeitschrift f. Fleisch und Milch Hygiene*, Vol. 12, p. 350, 1902) described a green discoloration of the fatty

tissue and underlying muscle, located at that part of the body which comes in contact with the ground when the animals lie down. The coloring was green, but located differently and probably of a different nature.

. BERG.

MILK FEVER(?) H. Walpole, M.R.C.V.S. *Veterinary Record*. Some three or four years ago, writes the author, a small half-bred North Country ewe was the last one of a small flock to lamb. She did it in the pasture where the grass was not rich. After lambing she was taken with the others and put in an orchard full of rich succulent grass. Within twelve hours after she had been there, she was found insensible on her side in a ditch and showing all the symptoms of milk fever: eyes amaurotic, stertorous breathing and complete insensibility. The udder was inflated with a small syphon and pump. Within one hour, she was on her legs and in an hour or so after showed no symptoms that anything had been wrong.

LIAUTARD.

THE FATE OF TWINS IN THE UTERUS OF THE COW. G. Giovannoli. *Schweizer Archiv für Tierheilkunde*, Vol. 57, pp. 520-524, 1915.—Occasionally both fetuses (twins) enter the pelvic inlet at the same time. A cow, after laboring 10 hours, was unable to pass the fetus although powerful traction was applied to the forelimbs. On careful examination I found that the forelimbs belonged, not to one calf, but to two.

I then located both forelimbs of one calf and roped them and traction was applied. I repelled the other calf at the same time with my hand. The first calf was easily brought out, soon followed by the second.

Generally the birth of one calf serves as a stimulus to the birth of the twin, but this is not always the case, as is shown by the following: A cow threw a normal calf and the fetal membranes were passed normally. Two days later the same cow threw a second normal calf.

What happens when one or both twins die *in utero* depends upon a large number of factors. The results cannot be predicted. Following is an interesting case: A 6 months pregnant cow came into milk. At the end of the normal gestation period the cow threw two calf mummies as large as cats. The fetal membranes were moist, intact and firmly attached to the fetuses. The cow

came into heat again at her regular time. The following case shows that the birth of one twin does not stimulate the birth of the other: On July 5, a cow expelled a very small dead fetus, it was as large as a mouse and enclosed in a sac of fluid. The cow was normal in general behavior and condition, udder slightly swelled and contained some milk; but the cow was not milked. In this case, as in the previous one, the expulsion of the dead fetus was coincident with the onset of estrum. On November 14, the same cow threw a perfectly normal, vigorous calf, much to the astonishment of the owner who believed the cow to be non-pregnant.

BERG.

PERITONITIS AND TRAUMATIC PERICARDITIS IN THE CAMEL. Hermanes Gibson. *Veterinary Record*.—A camel was reported dead. He was a five year old animal in good condition. The post-mortem is here revealed: carcass distended, considerable, claret colored, fluid escaped from the abdominal cavity when it was opened. The stomach was filled with ingesta. The liver showed fatty degeneration. Spleen, kidneys and bladder apparently normal. Congealed material was noticed near the esophageal entrance to the rumen, traced through the diaphragm to the pericardium, which contained one pint of claret colored fluid similar to that of the abdominal cavity. The condition pointed to the action of a small foreign body, a wire nail perforating the auricle, which had been picked up in the food by the camel.

LIAUTARD.

TUMOR IN THE PELVIC CAVITY OF A HORSE. Contribution to the Operative Treatment of Colic. Dr. Dornis. *Zeitschrift für Veterinärkunde*, Vol. 27, pp. 325-326, 1916.—A horse (gelding) suffered from chronic colic. The symptoms were somewhat variable and consisted of unrest, expressions of pain, and straining on the rectum, which caused the protrusion of a deep-seated swelling-visible on the left of the anus and near it. A similar picture was noticed, to a lesser degree, during the preceding 8 days and in all probability had existed unnoticed before that. Rectal examination disclosed a tumor in the pelvic cavity, estimated to be as large as a child's head. The pelvic part (Beckenstück) of the small colon was pressed together toward the right by the tumor.

Soon after the patient was admitted to the veterinary hospital the colic began anew and assumed such grave form as to indicate the necessity of immediate operation,

The horse was laid on his right side and chloroformed. In the furrow between the anus and the left tuber ischii an incision was made, 25 cm. long through the skin and underlying muscles (semi-membranosus and semi-tendinosus). Meanwhile an assistant pressed the tumor backwards, working with his hand in the rectum. A yellowish tumor was protruded. It was grasped with a large Billroth forceps and detached from the adjacent tissues. This was a comparatively simple operation, as the tumor had a smooth surface and was attached by loose connective tissue. In many places the separation was possible by blunt dissection. There was little hemorrhage. This made possible the complete removal of the tumor which extended anteriorly to the abdominal wall; it was limited on the left by the pelvic wall and on the right by the rectum which it surrounded dorsally and ventrally.

Shortly after the operation the horse defecated freely and without pain. He made a complete recovery and never showed symptoms of colic.

The tumor was unexpectedly large. During the operation it became apparent that the clinically estimated size of the tumor fell far short of the actual fact: the tumor weighed 4450 g. (9 pounds). Histological examination showed it to be a fibrosarcoma. It had the consistence of relaxed muscle.

BERG.

PULMONARY TUBERCULOSIS IN A CANADIAN HORSE. Veterinary Major Bringard. *Rec. de Med. Vet.*—Arrived from Canada, this horse entered the hospital on account of great debility from the ocean trip, and with pulmonary complications of distemper. His recovery was slow and incomplete. He soon gave full manifestations of chronic pulmonary and pleuritic lesions. Suspected of possible latent glanders, he was malleined on three occasions but always with negative results. He died in an extreme cachetic condition. At the post-mortem, no lesions of glanders were found. But in the thoracic cavity there were found old lesions on the pleura and in both lungs were numerous centers of imperfectly recovered lobular pneumonia were detected. These were principally in the anterior lobes with numerous grayish, homogeneous tubercles, without centers of caseation or softening. The bronchial lymphatic glands were very large and contained numerous yellow-grayish granulations. The bacteriologic examination of the lesions revealed the presence of the bacilli of Koch. Guinea pigs inocu-

lated with products from the lungs died in a few days and presented also the same bacilli at the microscopic examination.

LIAUTARD.

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FRACTURE OF THE OLECRANON PROCESS OF THE ULNA. J. Fox, M.R.C.V.S. *Veterinary Record*.—Case handsomely illustrated by a double inside and outside view of the fracture resulting in a six year old, well bred draught gelding, from a kick received during the night. There were small wounds on the outside of the fore arm and no lameness. The animal was put to work as usual but the next day he was very lame. At rest, the horse stood squarely on all four and apparently in no pain. In moving the affected leg was carried well. On manipulating, very little could be noticed and it was only on minute examination of the point of the elbow that the diagnosis was made with extreme difficulty for detection of the crepitation. The olecranon process at the post-mortem was found fractured into five fragments. LIAUTARD.

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EPIDEMIOLOGY OF EQUINE INFLUENZA. (Pink Eye, Brustseuche). Dr. Macek. *Wiener Tierärztliche Monatsschrift*, Vol. 2, pp. 553-567, 1915.—In their recent investigations of equine influenza, Gaffky and Lührs summarize their results as follows:

1. The transmission of influenza ordinarily takes place from horse to horse, without an intermediate carrier.
2. The incubation period is at least 16 days, in most cases between 20 and 40 days, and more than this in a few cases.
3. The inflammatory alterations begin in the finest alveoli in the lungs and may spread through the lung to the pleura.
4. About the fourth or fifth day of the disease, other bacteria, (streptococci) may invade the inflamed lung areas and cause necrosis.
5. The disease is not transmissible to healthy horses by inoculations from blood or organs of diseased horses. But the transmission may be made, though not always successfully by inoculating the bronchial secretions in the nasal cavity of a susceptible animal, without any trauma whatsoever.
6. In the ciliated epithelial cells found in the plentiful bronchial secretions of diseased animals, structures are noticed which may represent degeneration processes; and probably are not parasites. The authors believe, however, that parasites were found in other cells throughout the respiratory tract.

According to these authors, the causative agent of influenza localizes in the epithelium of the finer bronchi and alveoli without entering the general circulation. There the agent develops a toxin which causes influenza.

The following observations were made during an epidemic of influenza in 1913-14, and are of interest because they were made under natural conditions. There were 380 horses of which 76 were affected with typical equine influenza (Brustseuche).

1. The incubation stage in influenza is by far longer than has been supposed. In working horses it is from 3 to 4 weeks, while in resting horses twice this period may elapse before the outbreak of visible signs of the disease. This may account for outbreaks caused by bringing horses, quarantined for 4 weeks, into contact with healthy horses. Generally, during a 4 weeks quarantine, the disease will make itself manifest.

2. An infected horse can infect another horse not alone when distinct clinical symptoms of influenza are present, but also in the incubative stage, when it is apparently in good health and especially in the last few days preceding the outbreak of the disease.

3. The spread of influenza may be checked with certainty if the first cases are promptly isolated, thus preventing contact between infected and non-infected horses; the isolation stall need not be far from the others. It may be among them, just so long as healthy animals are not exposed by contact.

4. Influenza is transmitted mainly from horse to horse. In this connection the intermediate carriers play an unimportant role (i. e., the stall, people, dirt, straw, feed, rats, mice, sparrows, blankets, harness, pails, etc) Apparently, the causative agent of influenza soon dies outside of the body of the horse.

5. The spread of influenza from place to place is to be explained according to the previously made observations, i. e., that horses having a long incubation period transmitted the infection to other horses with which they had come in contact.

6. Reconvalescent, symptomatically treated horses should not be permitted to come in contact with healthy ones, until 4 weeks after fever has subsided. On the other hand, in animals that have received neosalvarsan injections, fever subsides in 36 to 48 hours after injection and 8 days after this subsidence of fever, the animals may be released.

Generally a single dose of 4.5 g. neosalvarsan was sufficient to reduce the fever in 24 to 36 hours.

BERG.

THE SIGNIFICANCE OF CERTAIN NATURAL FLAGELLATES OF INSECTS IN THE EVOLUTION OF DISEASE IN VERTEBRATES. H. B. Fantham and Annie Porter. *Journ. Parasitol.*, June, 1916, V. 2, No. 4, pp. 149-166.—In this paper the authors have summarized the work so far accomplished in showing the relation of the flagellates parasitic in insects to the flagellates parasitic in vertebrates. The very interesting fact has been demonstrated by a number of workers that many of the flagellates which are insect parasites, especially flagellates of the genus *Herpetomonas* and *Crithidia*, may be introduced into vertebrates, either by feeding the parasitized insects to the vertebrates or by subcutaneous or intra-peritoneal inoculation, and that these flagellates will develop and multiply in the new host and exert pathogenic effects. Thus Laveran and Franchini have infected dogs with flagellates from dog fleas, and have infected rats and mice with flagellates from the fleas occurring on these animals. Fantham and Porter publish a rather extensive list of experiments where they have introduced various herpetomonads of insects into different vertebrates and produced conditions resembling leishmaniasis or kala-azar.

The authors believe that the various herpetomoniasis, including the leishmaniasis, in vertebrates are the result of the introduction of the flagellates of insects or other invertebrates. The pathogenicity of these forms is explained on the basis that "The newer a parasite is to the animal harboring it, the less it is in harmony with its environment. The consequence is that its discord with the host is manifested by pathogenic effects and the latter animal succumbs. Chronic maladies are usually correlated with greater powers of adaptation of the parasite to its host, with the period that has elapsed since the original introduction of the parasite to the host, and with the relative resisting powers of the host to the specific action of the parasite."

Thus certain trypanosomes appear to have developed from the flagellates of certain insects (as *Drosophila*), and these insect parasites in turn appear to have developed from free-living forms, the flagellate becoming increasingly pathogenic in its evolution from a free-living form to one parasitic in vertebrates. The writers believe that the malarial parasites represent a similar development from a coccidian.

In the writers' experiments the inoculation of insect flagellates into vertebrates resulted in an active multiplication of the

parasite, giving rise to diseases running an acute or chronic course. Natural infestation of vertebrates with herpetomonads which were apparently from invertebrate sources is also known. The evidence is complete, according to Fantham and Porter, that the important group of diseases known as leishmaniasis are really invertebrate-borne herpetomoniasis, the parasites having evolved from flagellates of invertebrates.

This is a very interesting collateral development of the tremendously important subject of arthropod transmission of disease, and suggests the need of prophylaxis directed against arthropods as transmitters of pathogenic protozoa which are just becoming parasitic in vertebrates.

M. C. HALL.

GLANDERS DIMINISHING IN NEW YORK CITY. The administrative measures enforced by the Department of Health embrace the sanitary control of all stables in the city, the closing of public horse troughs, the making of specific diagnostic tests for glanders of all horses exposed to a proved case of glanders, the destruction of all reacting animals, the supervision of all horse-shoeing establishments, and the distribution of circulars of information on glanders to all horse owners, stable keepers, horse shoers, etc.

CASES OF GLANDERS IN NEW YORK CITY

	1914	1915	1916
First quarter.....	229	232	127
Second quarter.....	313	161	82
Third quarter.....	227	145	—
Fourth quarter.....	384	166	—
Totals.....	1,153	704	209

In an article on Municipal Abattoirs—A Community Necessity, by Alex. Grouchy, Jr., Mayor of Baton Rouge, La., the following statement is made: "The municipal abattoir of Baton Rouge, is a monument to the constant, earnest, intelligent recommendations of Dr. W. H. Dalrymple of the Louisiana State University, strongly seconded by Dr. Oscar Dowling, President of the Louisiana State Board of Health, and represents a giant step forward in matters of health regulations."

ASSOCIATION MEETINGS

AMERICAN VETERINARY MEDICAL ASSOCIATION

ADDRESS OF WELCOME

JAMES H. LEE, Detroit, Mich.

Mr. Chairman and Ladies and Gentlemen of the fifty-third Annual Convention of the American Veterinary Medical Association: It is a pleasant duty this warm morning, perhaps the warmest we have had in Detroit this summer, to extend to you a welcome on behalf of the Mayor of the City of Detroit. Mayor Oscar B. Marx is at the present time very busy, and it was an absolute impossibility at ten o'clock this morning for him to make arrangements to be here and welcome you in person, as he very earnestly desired to do. So he requested me to come here and in his behalf extend to you ladies and gentlemen who are entering upon this five-day convention in our city, a welcome.

In respect to the profession which you gentlemen represent, we here in Detroit through Dr. H. E. States, the veterinarian connected with the Board of Health of Detroit, have done much work along the line of conserving the public health through the veterinary profession. We are helped a great deal in this respect by the twelve government inspectors who work in conjunction with the Detroit Board of Health. My attention has been called by Dr. Patterson, a local veterinarian of very high repute, to the fact that the horse doctor of olden days has been relegated to the past; that the man who could go out and practise your profession without a scientific education, without a state examination, and a diploma, has gone the way of the old time lawyer who could be admitted to the bar upon motion.

It was my privilege about five years ago as a member of the state senate, to go into some of the laws governing your profession. I did that in conjunction with an effort to pass a bill relative to raising the standard of the legal profession by making it compulsory that candidates for admission to the bar in the state of Michigan pass a bar examination. At that time I found that every profession with the exception of the profession of the law, required that a man have a scientific education, that he pursue a certain course in his chosen profession in a standard school, and that he then take an examination. I was agreeably surprised to find,

at the time, because I had the prevailing idea that the veterinarian was simply a horse doctor, I say I was agreeably surprised, ladies and gentlemen, to find that the standard here in Michigan for admission to this profession is very high; that a man must have a college course in this work of, I believe, four years, and must then take an examination before a state board before being admitted to practice. It speaks well for the growth in popular estimation, and for the growth in professional standing, that this profession has attained.

To digress a minute to the City of Detroit, of course without saying it, you all know we have the most beautiful city in the world. Anent my being here this morning, I want to tell you a story. It used to be the custom of the municipality to have upon the city hall a large electric sign, reading "Welcome". That was stationary, stood there throughout the summer months and then underneath it, we would put the names of the various conventions that were meeting in the city; but conventions got to be so numerous, and so many came here simultaneously, that a little jealousy sprang up, and if we would say, Welcome to the Veterinarians of the World and the physicians happened to be here in session at the same time, you can see there would be jealousy. We found it impossible, having only one sign, to accommodate all conventions; and we then came to the conclusion that hot air was cheaper than electricity and could be more easily dispensed, and so we now come around to welcome you in person.

I want to have you ladies and gentlemen get around our beautiful city. I want also to extend to you a cordial invitation to come and meet his Honor, the Mayor. He wants you to call upon him, if you have an opportunity, either individually or in a body at the city hall—which is quite centrally located, just a block or two east—before you go away, so that he may shake your hands, and extend to you a welcome in person.

In closing I simply want to say that we give to you the full freedom of our city. We want you to have a good time. We want you to see some of the wonderful industries that we have here. We do not want you to forget that we are not only the greatest automobile city, but that we have the largest pharmaceutical works in the world. We want you to remember that we have the largest stove works in the world. We want you to remember that we have some of the finest boulevards. We want you to remember that we have some excellent water trips.

We want you to take in everything you can and enjoy yourselves, and when you go away you will say indeed our motto was a true one, that, "Detroit is a place where life is worth living." Ladies and gentlemen, I thank you.

RESPONSE TO THE ADDRESS OF WELCOME

TAIT S. BUTLER, Memphis, Tenn.

Mr. President, Mr. Lee and Ladies and Gentlemen: Since arriving in the city, or rather since leaving St. Louis yesterday morning, I have been trying to figure out this anomaly, this hot air proposition that Detroit is furnishing us; and I am glad that our friend, Mr. Lee, has stated the explanation. Certainly you will agree with me that it is sufficiently hot. I was interested in knowing the reason of that hot air, and we have just been told that Detroit has the largest stove factory in America here. I think they must all be at work. That statement may seem rather strange to you, as I come from the south, where we think it is hot, but we are not going to enter into any competition with Detroit along that line.

It is peculiarly fitting, it seems to me, that the American Veterinary Medical Association should meet in Detroit. We have heard repeatedly that the object and chief concern of our business was going out; and that Detroit was playing the chief role in putting the faithful horse out of business. This, my friends, is the answer of the American Veterinary Medical Association to all those false claims. Today there are more horses at work for man than ever before in the history of the world. Some of them, true, are working to his destruction, but by far the larger number are working for man's betterment. And this magnificent profession, splendid in its attainments, has progressed steadily for the protection and the development of the faithful friends of man, the live stock on the farm.

It seems to us that the future of the American Veterinarian is particularly bright. Perhaps it does not occur to you that of all the means of economically maintaining soil fertility—and by the way, the American acre only produces about one-half as much as the European acre—it is a fact, however, that among all the other means of building up and maintaining soil fertility economically,

that live stock has become recognized by all the authorities as one of the chief agents. Therefore, instead of having a small number of animals in this country per capita, the time is not far distant, certainly the time is coming when the number of domesticated animals in America will be doubled and trebled, they must be quadrupled, in proportion to the per capita, to what they are now, and the American veterinarian must profit in the same measure by the increase.

I am a substitute this morning, my friends, as was the gentleman who made the address of welcome. I have not the ability to express to Mr. Lee the appreciation of our welcome to Detroit. We have been here before. Sixteen years ago we were in this city. I remember it particularly for good and sufficient reasons. I am sure everyone who was here on that occasion has not failed, during all these past sixteen years to have in his heart a warm place for the veterinarians and the people of Detroit.

I wish to assure you, Mr. Lee, that we accept your kind welcome in the spirit in which it is given; and we feel confident, from past experience, that we shall have a splendid time in the city of Detroit; because as you have so truly said there is not a more beautiful city on this American continent. Long before I had ever seen Detroit I had heard of its beautiful streets, its splendid boulevards, its magnificent buildings, and when I came here I was not disappointed. I had not conceived that there was an American city so clean, so well built, so beautifully located with such picturesque parks and highways. Therefore we feel certain we are going to have a splendid time in this city of Detroit at this fifty-third meeting of the American Veterinary Medical Association; and I wish to thank you on behalf of my colleagues and the ladies and gentlemen here assembled, for your splendid address of welcome.

ADDRESS OF THE PRESIDENT OF THE A. V. M. A.

R. A. ARCHIBALD, Oakland, Cal.

Fellow Members of the American Veterinary Medical Association and Friends:

By reason of the high honor you conferred upon me a year ago, I am privileged to follow the time-honored custom established by my distinguished predecessors of addressing you this morning.

Before proceeding, however, I desire to take advantage of this opportunity in attempting to express my heart-felt appreciation for the great honor conferred in being elected to the office of President of the largest veterinary association in the world. I am keenly conscious of the fact that this honor was not bestowed upon me because of any intrinsic merit I might possess, but rather I desire the privilege of considering it a well deserved recognition of the yeomanry service in the work of upbuilding the veterinary profession in North America by the veterinarians of the Pacific Coast, particularly those of California.

California, even though somewhat isolated by location in the far west, has for the past few years ranked among the first two or three states in point of membership in this association. This should be looked upon as remarkable, and more credit is due when we consider the veterinary population of the State of California as compared with the veterinary population of such states as New York, Pennsylvania, Illinois, Iowa, Ohio, and others. As this condition of affairs cannot be ascribed to accident, it demonstrates that the work of organization along veterinary lines in California has been prosecuted unceasingly for the past twenty-five years.

From an analysis of the work accomplished by this association during the past twelve months, the following achievements stand out most prominently:—The acquiring of an official scientific Journal for this organization has been for many years a crying necessity and that this administration has been able to purchase the *American Veterinary Review* and successfully finance and edit the same for the past year as its own publication in the face of innumerable difficulties, must be considered gratifying in the extreme. When it is realized that in previous years this association was frequently in such financial straits as to make it necessary to borrow money in order to meet its obligations, makes this achievement still more impressive. We believe nothing has been done in recent years that will do more towards concentrating and cementing the interests of the veterinary profession in this country than the continued successful publication of this heretofore much needed veterinary literature.

As you all know, our efforts to obtain legislation for the army veterinarian has been finally brought to a successful termination, and while this administration desires as much credit as possible for the consummation of this desired recognition of our profession,

we do not wish in any way to undervalue the work of those who for years have untiringly waged a campaign to obtain this recognition for our army veterinarian. We realize very forcibly that many of our members have toiled faithfully for years to lay a foundation for this legislation and perhaps we have been undeservedly fortunate in being able to step in at the psychological moment and reap the reward for our army confreres that has long been their due.

While considering legislative matters we must not overlook the fact that a campaign is being waged to provide legislation whereby proper classification of employees of the Bureau of Animal Industry may be legalized and we sincerely hope and trust that the so-called "Lobeck Bill" will meet with a success similar to that of the army bill.

While we in the far West have only vague ideas of the intricacies of the sanitary and police problems which arose incidental to the late outbreak of foot-and-mouth disease in the east and middle west, we do believe we are sufficiently alive to the situation to unqualifiedly commend the work of our Bureau of Animal Industry whose destinies are watched over by our Drs. Melvin, Mohler, and an efficient corps of trained veterinarians, for the splendid manner in which it assumed the work of control and eradication. As a result of the firm stand adopted in the handling of this disease, the results accomplished by our Bureau will go down in the archives of veterinary history as one of the remarkable scientific achievements of all time.

While great credit is due the federal authorities in this connection, we must not overlook the splendid work performed by members of the profession occupying semi-official or perhaps unofficial positions. With few exceptions these men when called upon to assist at great personal and business sacrifices contributed their time and energy with only one objective viewpoint: viz, the eradication of apthous fever from this country.

Regarding the control of tuberculosis, it is quite apparent that we can only report progress at this time. It is hoped, however, that the International Commission on Bovine Tuberculosis will submit at this meeting data and advice that will tend to guide our footsteps over the many obstacles this problem presents, as it has done on several occasions in the past.

Hog cholera is another disease that should receive more study and consideration. We trust that some action will be taken during

this meeting towards laying a foundation for the control and use of anti-hog-cholera serum and virus, particularly virus. It has undoubtedly been shown in some states where the use of these biologics is properly controlled, that the most encouraging results have been obtained, whereas in communities where their use has been placed in the hands of the laity and other scientifically irresponsible individuals, the results have been disastrous, detracting as a result from the confidence that should and would be placed in these prophylactic agents if they were properly applied.

Little need be said with reference to the next most important disease, namely, contagious abortion. The program committee has arranged for a symposium upon this vital question and there is no doubt but that the ground will be thoroughly covered both by scientific papers and discussions.

Only passing mention of the above named disease is made, as it is realized that the various committees appointed for the specific purpose of considering the same will deal with them at such length and in such a manner as could not possibly be attempted in an address of this character.

A matter that is dear to our heart and which is considered pertinent to an address of this nature is the tremendous progress being made in the solving of problems underlying the question of immunity. As probably you all know the theories of Metchnikoff, Ehrlich and others, while they have served as stimulants and have laid a foundation for research and study, later developments have shown that such theories have failed to furnish logical explanations for the changes an animal undergoes during the progress of an infectious or toxemic disease. The work of Vaughn, Peterson, Wright, Jobling, Abderhalden, Bordet, Friedberger and many others have shown that the theory of phagocytosis of Metchnikoff and the side chain theory of Ehrlich have not been entirely satisfactory, and as a consequence they will have to undergo modification or even give way to the newer theories which deal with the physio-biological factors designated as ferments and antiferments. These elements are attracting the attention of physiologists, biologists and pathologists almost to the exclusion of all the hypothetical factors heretofore considered. The fact has already been established that normal balancing of these elements has a vital bearing on normal metabolism and that the therapeutics of the future will be largely confined to an attempt to regulate the normal balanced

relationship between these elements. In other words it becomes more and more apparent that upsetting this balanced relationship is the main factor in bringing about pathological conditions, and in controlling pathological conditions, the big problem confronting the medical world to day is how to rationally maintain the normal balance between the ferments on the one hand and the antiferments on the other by increasing or decreasing either as the occasion requires. The action of these ferments and antiferments, as research has shown, is not necessarily specific in character, hence, while specific reactions and changes are not denied, they are not the only factors involved in the process of immunity.

The lesson to be learned here is that those of us who have been pinning our faith on specific therapy in the treatment and control of infectious diseases and relying upon the doctrine of specificity to explain the changes occurring during the progress of acquiring immunity and in our study of immunology, must prepare ourselves to accept and to understand the principles involved in the newer ideas gained from actual experimental research and clinical application of the knowledge acquired by a study of the role played by the physio-biological elements known as ferments and antiferments.

The man who endeavors to keep up with the progress of scientific medicine of today has his work cut out for him, and in order to keep pace with modern progress, he must be endowed with extraordinary energy, in fact must be of an exceptional character and be fortified with a mentality that is capable of being stimulated by association and contact with those who are interested and are working along similar lines. No man who is devoting his life to the work, study, and elucidation of the many questions concerning the control and eradication of disease can hope to make progress along these lines unless he mingles with his fellow-men whose mission and life work is devoted to the solving of these problems.

Our main object in calling attention to these facts is to endeavor to show that the big problem of the man who is working along scientific lines today, even though he may be engaged in constructive work himself, is to keep abreast of the tremendous progress that is being made and to emphasize the fact that he who does not exert every energy he possesses with this object in view, will fall by the wayside or will at least become a nonentity in his community as far as the medical profession is concerned.

If these be the facts, it is quite evident that the veterinarian who desires to be alive to the issues of the day and remain in the march of progress, must take advantage of the facilities afforded by membership in the American Veterinary Medical Association and to use to the fullest extent the meetings of this association as a medium to commune and exchange ideas with his fellow-workers.

Coming down to a consideration of the future as it pertains to the welfare of this organization, the first problem that strikes us most forcibly is that of reorganization. It is self-evident that this association should proceed as rapidly as constitutional practice and parliamentary law will permit to change the present methods of conducting its ultra business affairs which have proven to be entirely inadequate to handle the enormous amount of business that is forced upon us as the result of rapid growth, increased membership and responsibilities. Reorganization of this association therefore, bringing it up to a standard commensurate with its size and future aims and objects, is unquestionably the most vital problem confronting us during this session. If this body should do nothing else during the next few days but reconstruct its constitution and by-laws, rendering them adequate to meet the necessities of such an organization as ours, we will feel when adjournment is reached that we have witnessed the conclusion of the most successful meeting in the history of this association. While we have no doubt that the committee on reorganization will submit a complete report dealing with this problem, we feel that the experiences of the past year have given us some insight as to the inadequacy of our present constitution and by-laws to meet the necessities and particularly the emergencies that crop up from time to time. In this connection therefore, I desire the privilege of submitting to you and to your executive committee, certain recommendations or suggestions.

We believe steps should be taken to interest all state associations in national association work, for if all state organizations became component parts of this association, it would solve the problem of controlling the personnel of our membership and in this way it could be readily determined whether or not a prospective member was or was not an association man and whether he was a man in good standing in his own community.

The custom followed by the American Medical Association of electing its president one year prior to the actual assumption

of the duties of his office should be adopted by this organization as we do not believe, judging from experiences gained during the past year, that any man should be injected into or be required to assume the duties and responsibilities incidental to the office of president without some time for preparation.

Some arrangement should be made to better control the indiscriminate use of the association's money, more especially in the matter of regulating appropriations and controlling the unauthorized contraction of bills by the various committees and resident state secretaries. The finance committee should be properly constituted and be required to pass upon all proposals for appropriations before such proposals are submitted to the association for final action. The committee on finance should also have jurisdiction over all matters pertaining to the finances of the association and should be empowered to employ an expert accountant to examine the books of the association at least once a year. Regarding this would also suggest that all moneys collected in the name of the association be placed in the hands of the treasurer and its use be controlled by the administration at all times.

It appears that the time has arrived when it is absolutely imperative to have a full time secretary elected for a period of not less than five years, whose office should be located where he would be in almost daily contact with the editor of our Journal.

It is essential that a fixed policy be adopted in regard to the matter of dues as it is quite evident that the present chaotic condition of affairs in this connection is, to say the least, deplorable. Your secretary in his annual report will probably have something to say on this question.

Associate members should be provided for as there are many men whose qualifications do not enable them to active membership, but whose support and co-operation would be invaluable from a scientific standpoint.

One of the most pressing needs is the early selection of a business manager for the Journal. At present such duties devolve upon the editor. We think it is the experience of all who are familiar with journalistic work that the functions of editor and business manager have seldom, if ever, been carried on successfully by one person. If this is true, the future success of our Journal necessitates the immediate selection of a business manager, whose mission it will be to take charge of the business features of the publication.

The suggestion is made that all papers and committee reports presented to the association be copyrighted and that only original papers be submitted to this body for consideration or to the Journal for publication.

In view of the tremendous change in the character of veterinary practice, especially in rural districts, conditions that are largely due to the passing of the horse, it would not only seem desirable but in fact especially necessary for this association to take a decided stand in requiring veterinary colleges to supplement regular veterinary instruction with a course on animal husbandry, particularly with reference to the breeding and care of meat and milk producing animals. If this policy is carried out, the veterinarian of the future will be enabled to occupy the position in farming communities that is now indifferently filled by the so-called Farm adviser or agricultural graduate.

The various veterinary educational institutions of this country should also be required to change their curricula so that students could acquire, at least, a fair working knowledge of problems incidental to veterinary sanitary science and police and public health matters in general.

This thought is suggested because in recent meetings called for the purpose of dealing with problems connected with animal husbandry, and sanitary problems incidental to the production of meat and milk, the veterinarian instead of being the leader or a prominent factor in such movements is only present by courtesy or as an invited guest.

The program committee has labored hard to prepare a splendid literary banquet for this meeting and bearing as it does, the names of the men who are constantly doing things, it is hoped that all will take advantage of the occasion presented to obtain all possible benefits therefrom.

This opportunity is taken to express my deep sense of appreciation for the splendid support accorded me during the past year by both officers and members of the various committees and I particularly desire to express my heart-felt appreciation for the support and assistance accorded me by your secretary, Dr. C. M. Haring, who has been untiring in his efforts not only to assist me with counsel and advice in the hour of need, but also for the vast amount of time and energy he has displayed in conducting the

affairs of the association with only one thought in mind, the best interests of the profession we have the honor to represent.

I realize fully that your time is altogether too valuable to be taken up by me in the discussion of generalities so I will close by expressing the hope that this meeting will be a success and will be marked by harmonious deliberation so that our thoughts will not be swayed by personal grievances and desires, but will be centered upon the business at hand for in that way only can the best possible interests of the veterinary profession as a whole and the individual as a unit be conserved and promoted.

REPORT OF THE TREASURER OF THE A. V. M. A.

RECEIPTS FROM OCT. 4th, 1915, to AUGUST 2nd, 1916.

1915	
Oct. 4, Balance in bank as per report of George R. White, Treasurer, as of August 30th, 1915.....	\$ 1,192.27
Oct. 18, Received from C. M. Haring, Secretary.....	2,740.60
Dec. 4, Received from C. M. Haring, Secretary.....	349.00
1916	
Jan. 8, Received from C. M. Haring, Secretary.....	166.30
Feb. 24, Received from C. M. Haring, Secretary.....	700.00
Interest from bank.....	4.59
Mar. 1, Received from C. M. Haring, Secretary.....	500.00
Mar. 23, Received from C. M. Haring, Secretary.....	500.00
April 10, Received from C. M. Haring, Secretary.....	400.00
April 24, Received from C. M. Haring, Secretary.....	300.00
April 27, Received from C. M. Haring, Secretary.....	300.00
May 29, Received from C. M. Haring, Secretary.....	450.00
June 22, Received from C. M. Haring, Secretary.....	500.00
July 21, Received from C. M. Haring, Secretary.....	1,000.00
Aug. 2, Received from C. M. Haring, Secretary.....	1,000.00
Aug. 2, Interest from bank.....	8.67
Total receipts from Oct. 4, 1915 to Aug. 2, 1916..	
	\$10,111.43

DISBURSEMENTS FROM OCT. 4, 1915, to AUG. 2, 1916.

1915.	
Oct. 15, M. H. Reynolds, Expenses College Committee.....	\$ 40.54
Oct. 15, Dr. Wm. M. Burson, Expenses Resident Secretary, Athens, Ga.	3.00
Oct. 15, Mrs. Elta L. Paxon, Postage expended by the late H. D. Paxon as Secretary of Illinois.....	2.00
Oct. 15, N. S. Mayo, On account of salary.....	200.00
Oct. 15, F. H. Schneider, Postage and printing as Resident Secretary Penna.....	29.00
Oct. 15, N. S. Mayo, Postage and Incidental expense from May 12, to Aug. 6, 1915.....	71.35
Oct. 15, Dr. Geo. H. Glover, Expense as chairman of Committee on Advertisement of Veterinary Remedies.....	7.20
Oct. 20, American Veterinary Review, First installment on purchase of Review, as per contract between Robt. W. Ellis, and Sub-committee (Dr. Eichhorn, Dr. Lyman, Dr. Marshall)	1,000.00

1915.		
Oct.	23, W. Dean Wright, Expense as Resident Sec'y of Oregon	10.95
Oct.	23, Dr. David Fox, Expense as Resident Sec'y of California	23.60
Oct.	23, N. S. Mayo, Expense and incidentals as Secretary, Aug. 9th to Sept. 20, 1915.....	45.71
Oct.	23, N. S. Mayo, Expenses from Chicago, Ill., to Oakland, Cal.	141.18
Oct.	23, Foster & Parker, Printing and shipping Treasurer's Report	73.25
Oct.	23, E. Burrel, For typing College Committee's Report.....	44.15
Oct.	23, Dr. J. D. Fair, Expense as Resident Secretary of Ohio...	7.25
Oct.	23, Dr. Arthur Hughes, Veterinary History Committee of the A. V. M. A.....	3.28
Oct.	23, Chauncey Halt Co., For 1000-16 pp. Constitution and By-Laws	33.00
Oct.	23, Dr. P. A. Fish, Expenses in connection with new Journal	15.65
Oct.	23, Dr. C. J. Marshall, Travelling expense in connection with new Journal	5.60
Oct.	23, Alma Ostrom, Clerical services to Secretary of A.V.M.A.	10.00
Oct.	23, A. J. Tupa, Stenographic services for College Committee Report	26.51
Oct.	23, Juster & Baird, Premium on bond of C. M. Haring, Sec'y	8.75
Oct.	23, Dr. Richard Lyman, Travelling expenses in connection with new Journal.....	48.88
Oct.	23, Chas. P. McLafferty, Printing and stationery.....	40.30
Oct.	23, A. Carlisle & Co., Stationery and office supplies for Sec'y's Office	11.70
Nov.	13, Dr. A. Eichhorn, Expense in connection with sub-committee on Journal.....	18.62
Nov.	13, Multigraph Letter Co., Multigraphing letters	3.41
Nov.	13, Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A.	100.00
Nov.	13, Dr. C. M. Haring, Acct. of salary as Sec'y of A.V.M.A.	100.00
Nov.	13, United States Fidelity & Guaranty Co., Premium F. H. Schneider's bond	2.50
Nov.	13, Wm. F. Murphy's Sons Co., Office supplies for Treasurer	6.80
Nov.	13, Sun Printing House, Printing stationery.....	8.00
Nov.	13, Miss Bertha C. Spencer, Time and services reporting convention of A.V.M.A.	245.15
Dec.	4, The Multigraph Letter Co., Multigraphing letters.....	2.85
Dec.	4, The O'Donnell Printing Co., Printing.....	30.00
Dec.	4, The Multigraph Letter Co., Multigraphing letters.....	2.85
Dec.	4, John W. Spence, Stationery for Executive Committee..	10.00
Dec.	4, Dr. P. A. Fish, Freight on Reviews for October and back numbers	10.43
Dec.	4, Dr. P. A. Fish, Clerical work, typewriting and book-keeping	37.20
Dec.	4, Dr. P. A. Fish, Acct. salary as Editor of Journal of A. V.M.A.	100.00
Dec.	21, Norton Printing Co., Printing November Journal and letter-heads	478.43
Dec.	21, Cornell Co-Operative Society, Office supplies furnished the Journal of A.V.M.A. for use by Dr. Fish.....	29.15
Dec.	21, Dr. P. A. Fish, Expenses and telegrams.....	4.89
Dec.	21, Dr. P. A. Fish, To cash advance of \$300.00 to use as revolving fund, as per action of Executive Committee 12-1-15	300.00
Dec.	21, Dr. David E. Buckingham, Advance to be used by Legislative Committee	100.00

1915.

Dec. 29, Dr. J. J. Kerr, Membership and Dues returned—Application received too late for action.....	8.00
Dec. 29, Dr. W. H. Lynch, Membership Fee and Dues returned...	8.00
Dec. 29, H. E. Hosbach, Clerical work and auditing Treasurer's books	5.00
Dec. 29, Bertha C. Spencer, Transcribing of proceedings of Veterinary Faculty and Examining Boards of N. A.....	51.00
Dec. 29, American Veterinary Review, 1890 copies of October issue of Journal at \$8.00 per 100—extra numbers...	151.00
Dec. 29, E. H. Yunker, Flowers for David McKibbin, Dec.....	10.00
Dec. 29, Murray J. Brady, Report of Executive Committee Meeting, Dec. 1, 1915, Chicago.....	23.40

1916

Jan. 10, D. H. Halles, Membership Fee and Dues returned....	8.00
Jan. 10, A. A. Cuthberton, Membership Fee and Dues returned..	8.00
Jan. 10, J. MacDonald, Membership Fee and Dues returned....	8.00
Jan. 10, M. A. Sheman & Sons, Letterheads and envelopes for Committee of Intelligence and Education.....	2.50
Jan. 10, P. A. Fish, Salary as Editor of Journal.....	100.00
Jan. 30, C. P. McLafferty, Letterheads and envelopes for Sec'y's Office	29.00
Jan. 29, Chauncey Halt Co., Balance on bill Aug. 1, 1915.....	2.00
Jan. 29, Dr. C. M. Haring, Acct. salary as Sec'y A.V.M.A.....	100.00
Jan. 29, The Multigraph Letter Co., Multigraphing letters.....	4.00
Jan. 29, Joseph Mosher, Membership Fees and Dues returned...	8.00
Jan. 29, Dr. C. M. Haring, Office expenses of Sec'y from Sept. 4, 1915, to Jan. 14, 1916.....	285.57
Feb. 12, N. S. Mayo, Expense as Chairman of Committee of Investigation of Vety. Colleges.....	49.55
Feb. 12, N. C. Netherwood Printing Co., Letterheads and envelopes for Committee on Agricultural Colleges.....	7.25
Feb. 26, Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A..	100.00
Feb. 26, Lederer, Street & Zlus, Printing application blanks and circulars	38.60
Feb. 26, C. P. McLafferty, Letterheads and engraving.....	48.50
Mar. 3, Dr. S. H. Ward, Expense visiting Educational Institutions	82.32
Mar. 3, N. S. Mayo, Inspection of Colleges.....	49.34
Mar. 3, Dr. P. A. Fish, Salary as Editor of Journal A.V.M.A..	100.00
Mar. 3, American Veterinary Review, Part Payment for A. V. R.	500.00
Mar. 10, Multigraph Letter Co., Multigraphing and addressing..	9.75
Mar. 18, Dr. Chas. H. Higgins, Postage and stationery.....	13.00
Mar. 18, Ithaca Realty Co., Premium on bond of Editor Journal A. V. M. A.....	7.50
Mar. 18, Lederer, Street & Zlus Co., Printing circulars, membership cards, etc.....	144.30
Mar. 18, Multigraph Letter Co., Multigraphing and addressing...	27.43
Mar. 30, Dr. C. M. Haring, Office expenses and incidentals as Sec'y	192.33
Mar. 30, Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A.	100.00
Mar. 30, Dr. J. C. Gibson, Expenses as resident Sec'y Des Moines, Iowa	30.00
Mar. 30, Dr. David E. Buckingham, Expenses in matter of Army Legislation	200.00
April 10, Dr. S. H. Ward, Expense incurred while inspecting Colleges	47.29
April 10, Dr. W. B. Mack, Expense incurred while inspecting San Francisco Veterinary College.....	28.20
April 10, N. S. Mayo, Expense incurred while inspecting Colleges.	47.27
April 10, Dr. C. M. Haring, Letterheads, etc.....	5.50

1916.		
April 10,	B. H. Edgington, Expense incurred while inspecting colleges	21.45
April 10,	D. C. Gearhart, Refund of Initiation Fee on acct. of having subscribed to Journal.....	1.00
April 24,	Dr. A. Eichhorn, Stationery and postage as Sec'y of Committee on Journal.....	12.50
April 24,	Dr. C. M. Haring, One-fifth of annual salary as Sec'y..	100.00
April 24,	Dr. P. A. Fish, For revolving fund for Journal of A.V. M.A.	300.00
April 24,	George Hilton, Customs duty on stationery.....	2.13
April 24,	C. P. McLafferty, Letterheads.....	43.90
May 4,	Dr. David E. Buckingham, Current expenses of Legislative Committee	200.00
May 4,	Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A.	100.00
May 4,	Dr. Edw. A. Cahill, Flowers—funeral of Dr. Francis Abele	10.00
May 4,	Dr. S. W. Allen, Expenses as resident State Sec'y Watertown, S. Dakota, 1911-12-13-14-15.....	35.00
May 4,	A. S. Cooley, State Veterinarian, Investigating the Veterinary College at Toronto for Committee on Intelligence and Education.....	30.74
May 4,	The Multigraphing Letter Co., Multigraphing, etc.....	10.75
May 23,	Lederer, Street & Zlus Co., Printing circulars and envelopes	42.05
May 23,	Geo. W. Dunphy, Services and expenses on Committee Inspecting Colleges	27.13
May 23,	G. A. H. Edmuiston, Refund of Initiation Fee.....	3.00
May 23,	Gladys H. Lent, Multigraphing letters.....	4.67
May 23,	Lederer, Street & Zlus Co., Envelopes.....	2.85
May 23,	The North Central Publishing Co., Envelopes.....	3.25
May 31,	Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A.	100.00
June 8,	Dr. E. T. Baker, Expense while investigating Washington State College	12.50
June 8,	Dr. H. Preston Hoskins, Postage—(Membership Campaign)	15.00
June 23,	Dr. E. A. Downs, Refund of subscription to Journal on Initiation Fee	3.00
June 23,	Dr. Upton N. Stuart, For overpayment of Application Fee	4.00
June 23,	Dr. Daniel J. Meador, For overpayment of Application Fee	3.00
June 23,	Dr. F. R. Wadsworth, Refund of subscription price of Journal	3.00
July 1,	Dr. C. M. Haring, One-fifth salary as Secretary.....	100.00
July 1,	Dr. P. A. Fish, Salary as Editor of Journal A.V.M.A...	100.00
July 1,	Dr. P. A. Fish, Revolving fund for Journal A.V.M.A...	300.00
July 1,	Multigraph Letter Co., Multigraphing.....	32.19
July 1,	Dr. C. D. Turney, Refund of subscription price to Journal	3.00
July 22,	Dr. H. K. Moore, Refund of Student subscription price of Journal on Application Fee.....	2.00
July 22,	American Veterinary Review, On acct. purchase of A.V. M.A.	500.00
July 22,	Dr. P. A. Fish, Revolving fund for Journal of A.V.M.A.	400.00
July 22,	Dr. P. A. Fish, Salary as Editor of Journal of A.V.M.A.	100.00
Total expenditures, 1915-16.....		\$ 8,762.37

Total receipts	10,111.43
Total expenditures	8,762.37
Balance in bank	\$ 1,349.06

Respectfully submitted,

F. H. SCHNEIDER, *Treasurer.*

American Veterinary Medical Association:

GENTLEMEN:—We certify that the enclosed settlement is correct, balance to your credit this date shows \$1,349.06 as per enclosed book and cancelled checks.

Philadelphia, Pa., Aug. 3, 1916.

J. F. BAUDER, *Cashier,*
The Tenth National Bank.

NEW YORK STATE VETERINARY MEDICAL SOCIETY

The twenty-seventh annual meeting of the New York State Veterinary Medical Society was held at the New York State Veterinary College at Cornell University, Ithaca, N. Y., August 2, 3 and 4. Slightly over one hundred veterinarians and about twenty-five ladies were in attendance.

The meeting was called to order by President Otto Faust of Poughkeepsie. Addresses of welcome were given by Prof. T. F. Crane on behalf of the University and Mr. J. L. Rothschild on the part of the City of Ithaca. These were responded to on behalf of the society by Dr. E. B. Ackerman of Brooklyn.

These addresses were followed by the general business meeting, including the reports of the various committees. Included in the Report of the Prosecution Committee were the following two articles:

“ARTICLE 1. Any member who shall knowingly issue a false report of a tuberculin or other test for tuberculosis of cattle or shall issue a false certificate of soundness upon any domestic animal or shall, with intent to deceive, render a false diagnosis in any case of dangerous contagious disease shall, after a hearing and due proof, be expelled from the society. Should charges under this section be filed with the Board of Censors and such Board should deem the charges of sufficient merit, it shall promptly refer such charges with evidence obtained to the Regents of the University of the State of New York or other authorities for immediate action.

“ARTICLE 2. Any member who shall have in his employ for the purpose of rendering veterinary service, an unlicensed veterinarian as assistant, agent, partner, or in any other capacity whatever, shall be expelled from this society. This section shall not be

construed so as to prevent a licensed veterinarian from employing a bona fide veterinary student fully matriculated in a veterinary college, whose graduates are eligible to take the State Veterinary Examinations, to assist him as a student during the regular vacations of the veterinary college."

It was recommended that these be added to the Code of Ethics. The society voted to present these articles to be incorporated in the By-Laws at the next annual meeting as is laid down by the Constitution.

The Resolutions Committee presented the following which were adopted:

"No. 1. The New York State Veterinary Medical Society assembled at Ithaca, N. Y., August 2, 3, and 4, 1915, regrets the deplorable condition the war has forced upon our brother veterinarians in Europe and resolves herewith to cooperate with the movement instituted by Dr. Liautard of France for their relief and assistance by tendering the financial support of this society to the extent of 107 dollars.

"No. 2. Resolved that it is the sense of this meeting that the emblem of the A. V. M. A. be a plain enameled cross, color to be the same as that designated by the United States Army Veterinarians and the same to have A. V. M. A. in plain black letters across the front.

No. 3. Whereas: Certain practices and conditions recently exposed as existing in the meat inspection service of New York City Department of Health have reflected discredit on the veterinary profession of New York City and New York State, and

Whereas: Only one of the guilty persons involved is a member of the New York State Veterinary Medical Society, and we believe this case will be properly dealt with as soon as the New York City authorities have finished their investigation, as a Society we assume no responsibility for the conduct, therefore be it

Resolved: That this society recommend to the proper authorities of the Health Department and the city administration of the City of New York that salaries paid veterinary inspectors be commensurate with their duties, thereby insuring better service. And further, be it

Resolved: That a copy of this resolution be submitted to the Health Commissioner.

"No. 4. Inasmuch as practical knowledge, scientific investigation and research has proven that the spread of tuberculosis and contagious abortion, together with its allied diseases is being extensively disseminated through the dairy and breeding herds throughout the state, due to the feeding of raw skim milk and whey from public milk plants, cheese and butter factories, and

Whereas: A special commission appointed by Ex-Governor Glynn prepared a very complete and exhaustive report setting forth practical and efficient methods of procedure to remedy these undesirable conditions through the universal and efficient pasteurization of these by-products, and

Whereas: This society believes this procedure to be an important and effective means of preventing the spread of these diseases to hogs, calves and young stock, therefore be it

Resolved: That this society requests the Commissioner of Agriculture to do everything in his power to bring about such desirable legislation at the next session of the Legislature, and furthermore be it

Resolved: That a copy of this resolution be transmitted to the Commissioner of Agriculture and the chairmen of the committees on Agriculture in the Senate and Assembly at the next session of the Legislature."

The program of papers was printed in the last number of the JOURNAL and was carried out as given. The discussion was excellent and much valuable information was thereby brought out. The papers will be printed in the Proceedings of this society.

The officers elected for the coming year were as follows:

President, J. G. Wills, Department of Agriculture, Albany, N. Y.; Vice-President, Geo. A. Knapp, Millbrook; Secretary-Treasurer, C. P. Fitch, Ithaca; Librarian, W. L. Williams, Ithaca.

Board of Censors: W. G. Hollingworth, Utica; Henry Cady, Gloversville; J. McCartney, Middletown; R. S. MacKellar, New York; C. S. Chase, Bay Shore.

It was voted to hold the next meeting in Brooklyn.

C. P. FITCH, Secy.

PRESIDENT'S ADDRESS*

OTTO FAUST, Poughkeepsie, N. Y.

Members of the New York State Veterinary Medical Society:

I take this opportunity to express to you my gratefulness for the honor you have conferred upon me by electing me president of this society.

This honor I have tried to appreciate by giving my best efforts for the welfare of the society and veterinarians of the state.

In compliance with Section 1, Article 1 of the By-Laws, I submit the following communication:

DISEASES: *Foot-and-Mouth Disease.* This disease has been successfully controlled in this state at a cost of \$275,000.00, the last outbreak occurring on August 10th, 1915. The Department of Agriculture should be congratulated on the efficient work it has accomplished.

Rabies, anthrax, blackleg and hog cholera are being held in subjection.

Contagious abortion. This disease is of great importance to the veterinarians and cattle breeders of this state, and I am sorry to report to you that we are still in the dark as to its control, but in the near future, through the work now being carried on by special investigations under the supervision of Dr. W. L. Williams, we hope to receive a more favorable report.

Tuberculosis: According to the statistics compiled by the Department of Agriculture this disease has been gradually lessening; in the year 1909-1910, 21% of the cattle examined by the state were condemned, while in the year 1914-1915, 11% were condemned, also the first half of the fiscal year ending April 1st, 1916, showed about 11% condemned of those examined, showing a decided decline from 21% to 11% in five years.

The following is a report in full from the Department of Agriculture:

*Presented at the meeting of the New York State Veterinary Medical Society, Ithaca, N. Y., August 2, 1916.

BOVINE TUBERCULOSIS.

	Fiscal Year 1909-10	Fiscal Year 1910-11	Fiscal Year 1911-12	Fiscal Year 1912-13	Fiscal Year 1913-14	Fiscal Year 1914-15	First Half Fiscal Year 1915-16
No. of cattle examined by the State	14,181	17,909	21,421	18,068	18,284	17,292	14,830
No. of cattle condemned at such examinations	3,029-21%	2,993-16%	4,178-19%	2,891-15%	2,139-11%	1,916-11%	1,744-12%
Results of Post Mortem							
{ No. of cases of localized tuberculosis	1,685	2,069	2,690	1,949	1,409	1,277	1,157
{ No. of cases of general-ized tuberculosis	1,240	824	1,117	581	424	401	330
{ No. of "No Lesion" cases (no disease found)	104-3%	100-3%	93-2%	85-2%	70-3%	80-4%	83-4%
No. of cattle examined privately (at owner's expense) no record	No Record	5,993	12,038	20,545	23,815	21,863	
No. of cattle rejected at such examination	" "	425	473	528	896	728	
Total No. of cattle examined	" "	23,902	33,459	39,213	42,099	39,155	
Total No. of cattle rejected	" "	3,418-14%	4,651-13%	3,419-8%	3,035-7%	2,645-6-7%	

GLANDERS—From the report of the Department of Agriculture we find that the number of clinical cases has been reduced, in 1909-10-83% of the cases condemned were clinical cases, and in 1914-1915-25% were clinical cases.

The following is a report in full from the Department of Agriculture:

GLANDERS.

	Fiscal Year 1909-10	Fiscal Year 1910-11	Fiscal Year 1911-12	Fiscal Year 1912-13	Fiscal Year 1913-14	Fiscal Year 1914-15	First Half Fiscal Year 1915-16
No. of horses and other equine animals condemned because of Glanders.....	743	1,401	1,631	1,640	1,608	1,198	444
Results { No. of cases of Clinical of Post Glanders	618-83%	1,140-81%	1,294-79%	1,217-74%	677-42%	305-25%	133-29%
Mortem { ical Glanders	125	258	329	419	927	890	308
No. of "No Lesion" cases (no disease found)	3	8	4	4	3	3

CHARLES S. WILSON, Commissioner,
J. G. WILLS, Chief Veterinarian.

LEGISLATION: On account of the new annual registration law passed last year, we have had considerable trouble with our legislation.

We have for years depended upon our Educational Department to assist us in keeping up our professional standing, but for some reason which does not seem clear at this time the so-called McNab bill which allows registration without examination under certain conditions was supported by that department. I believe I express the sentiment of a majority of our profession in stating that such legislation is retrogressive rather than progressive. There seems to be some doubt as to the constitutionality of such a law.

Most of you know of the effort made to defeat this and other objectionable bills, but we were unable to make our opposition felt as strongly as it should have been because of lack of early information on these bills.

This society should employ one of the agencies at Albany to furnish the chairman of the legislative committee a copy of every bill as soon as introduced having any bearing on veterinary medicine.

Laws favorable to the profession have been passed such as the Halliday bill, appropriating \$15,000.00 for special investigation of contagious abortion, and the Wilson bill, providing for the licensing of stallions.

As you know, the prosecution of illegal practitioners is through the channel of the Attorney-General's office, but from the experience of the year just passed very little will be accomplished unless the society takes a decided stand. It is evident that it cannot accomplish the desired results unless the profession renders every possible aid.

I do not wish to go into details, but will tell you that the committee on prosecution have a communication which they will present and I hope that you will give it your earnest consideration.

SOCIETIES: We have in this state six local veterinary societies. From the reports received and from my personal observation of those that I had the pleasure of visiting, convinces me that they are a great benefit not alone from an educational standpoint, but they also promote sociability among our practitioners which has been somewhat neglected in past years.

The conference given by the Veterinary Department of the New York State Veterinary College at Ithaca on January 11 and

12th, 1916, was one long to be remembered. The Faculty and Student Welfare Club are to be congratulated for their successful educational and social conference.

Our state society has a membership of 177, which is a slight increase over last year, but when we take into consideration that there are nearly 700 veterinarians who are eligible to become members, it seems to me that something should be done. I would recommend that the president appoint county secretaries to make a special effort to increase our membership.

The State Breeders' Association and the State Dairymen's Association should be of more interest to the profession as the results to be obtained are of mutual interest to all and by our attendance at their meetings show them that we are interested in their work. With the breeders, dairymen and veterinarians united for the one object, the improvement of our live stock, we should be a power in this state.

I wish to thank the officers and members for their able assistance given me during the past year.

OKLAHOMA GRADUATE VETERINARY MEDICAL ASSOCIATION

The Meeting of the O. G. V. M. A., July 18-19, resulted in the coalescing of the two graduate veterinary associations of this state with the election of the following officers for the new association: R. Fred Eagle, Pres.; Joseph E. Nance, Vice-Pres.; C. C. Hooker, Treas.; and R. C. Smith, Secy.

The name of the new organization is the Oklahoma State Veterinary Medical Association. It starts out with a membership of about seventy-five.

R. C. SMITH, Secy.

CONNECTICUT VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Connecticut Veterinary Medical Association was held at the hospital of Dr. E. F. Schofield at Greenwich, Conn., on Tuesday, July 25th.

There were thirty-eight members and visitors in attendance at the time of the clambake, which was served at about two P. M. and was apparently greatly enjoyed by all.

Dr. Schofield's establishment is situated in the midst of a beautiful city park and its surroundings were highly conducive

to the enjoyment of those present. The day was devoted to the reading of papers and discussions and to clinics.

At its business meeting the association voted to go on record as being in favor of the adoption of the blue cross, as the national Veterinary Emblem and directed the treasurer to draw a check for fifty dollars as the C.V.M.A.'s contribution to the Salmon Memorial fund.

A. T. GILYARD, Secretary.

WISCONSIN VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Wisconsin Veterinary Medical Association was held at Menomonie, Wis., July 26-27, 1916.

When President L. J. O'Reilley sounded the gavel on the morning of July 26th, in the Chamber of Commerce Parlors, he called to order one of the largest and most instructive meetings our association ever held. The forenoon of the first day was taken up by a general business session, and the reports of several standing and special committees.

The program which was carried out in full for the balance of the meeting consisted of the reading and discussion of the following papers:

- Torsion of the Uterus in the Mare, Cow, and Sheep.....
-Ed. Boesewetter
- Necroforus Infection in Colts.....O. A. Rabe
- Dourine (Maladie du coit).....S. H. Ward
- State Veterinarian of Minnesota
- AzoturiaH. Gutschenritter
- The Bull as a Disseminator of Contagious Abortion.....
-F. B. Hadley and H. Lothe
- An Indication Signified by Bowel Palpation.....
-J. W. Beckwith
- An Interesting Case Report on Sterility in a Stallion....
-C. W. Brown
- Paresis in Swine due to Constipation.....A. E. Fabian
- A question box, creating a prolonged discussion on questions of vital importance.

We were exceedingly fortunate in having Drs. C. E. Cotton and S. H. Ward of Minnesota with us. The part they took in our program and in the general discussions was greatly enjoyed by all

present. To show their appreciation, the association elected them to Honorary Fellowship in our Society.

One half day of the session was given over to a clinic which was arranged for by Dr. J. D. Lee, and held at his infirmary. The amount of material and kind of subjects selected surely did credit to Dr. Lee and his assistants. Out of the ordinary was a stock judging demonstration by Prof. Pickford of the College of Agriculture.

The meeting was closed on the afternoon of July 27th, with a short business session, at which time the association passed a resolution setting permanent dates for our annual and semi-annual meetings for the third week in January and July of each year.

With many thanks to the citizens of Menominee and Dr. J. D. Lee for courtesies rendered the meeting closed with a smoker tendered by the Chamber of Commerce on the evening of July 27th.

Adjournment was taken to meet at Madison, January 16, 17 and 18th, 1917.

W. A. WOLCOTT, Secretary.

MISSOURI VALLEY VETERINARY ASSOCIATION

The Missouri Valley Veterinary Association held its 22d annual meeting at Omaha, Nebraska, July 10, 11 and 12. The meeting was well attended and was in every way a success.

In the absence of Mayor Dahlman the address of welcome was made by City Attorney Tepole. Dr. R. C. Moore, one of the three charter members present, responded to this address, briefly reviewing the work of the association and calling attention to present conditions as they pertain to veterinary progress.

Some very interesting reports and papers were read and valuable discussions were elicited. Among the newer ideas introduced might be mentioned Dr. Bemis' method of producing local anaesthesia for equine dental operations. This consists of injections of cocain or similar agents along the course of the maxillary and mandibular nerves near the points where they enter their respective foramina in the jaw bones. Another comparatively new procedure introduced was the immunization of cattle against blackleg by simultaneous vaccination with virus and hyperimmune serum. This has been worked out by the Veterinary Department of the Kansas State Agricultural College and was presented to the association in a paper by Dr. F. S. Schoenleber.

A splendid paper entitled "Important Essentials in Profitable Horse Production" was read by Dr. C. W. McCampbell, Secretary of the Kansas Livestock Registry Board. He pointed out that it is costing American farmers more to rear the average colt than the animal is worth upon reaching a marketable age; he showed that a colt from a grade stallion is worth about half what a colt from a pure bred sire is worth, both from the same dam and reared under like conditions. His plea was for a higher standard in our breeding stock, particularly in stallions.

Other papers of merit were read by Drs. J. I. Gibson, S. W. Alford, Henry Hell, E. A. Logan, C. F. Nord, E. L. Quitman, N. S. Mayo, C. J. Norden, W. W. Dimock and C. A. Langenfeldt.

The clinic, which was held on the second day, was unusually well attended and a very full program was provided by members of the local committee. A young sow with eversion of the vagina was operated on by Dr. Shipley. This case was interesting because it was one of a herd of forty or more, nearly all similarly affected. Several members reported the sporadic appearance of this condition in their respective localities. It seems to be not hereditary or due to any anatomical deficiency, but rather to some form of dietary intoxication. Dr. E. L. Quitman, assisted by Dr. D. M. Campbell, demonstrated a new method of inducing anaesthesia in dogs.

Initiation into the Ak-Sar-Ben, the unique booster organization of Omaha business men, and a banquet at the Hotel Castle were the most notable features of the social program.

Resolutions of condolence to the relatives of deceased members were adopted. Other resolutions proposed and adopted are as follows:

RECOGNITION OF THE FINAL ERADICATION OF FOOT-AND-MOUTH DISEASE FROM THE UNITED STATES. *Whereas* the livestock industry was severely affected by the recent outbreak of foot-and-mouth disease;

Whereas the disease has been successfully eradicated by the Bureau of Animal Industry through cooperation with the various states concerned;

Whereas the work was successfully consummated with a limited loss of livestock considering the extent of the outbreak and at a less expenditure of money than in any similar outbreak on record;

Therefore be it resolved that this association express its grati-

fication and confidence in the ability of the veterinarians taking part in this work;

And be it further resolved that this association further appreciates the cooperation of the livestock interests which facilitated the prompt eradication of the disease;

And be it further resolved that a copy of these resolutions be forwarded to the Secretary of Agriculture, U. S. A.

PASSAGE OF THE ARMY BILL. *Whereas* the Congress of the United States has seen fit to recognize the importance of the army veterinary service by commissioning the army veterinarians;

Whereas the Honorable James Hay and Dr. W. Horace Hoskins, many Senators, other Representatives, veterinarians and members of the army legislative committee, devoted much time and energy in support of this bill to its successful passage;

Therefore be it resolved that this association express its appreciation of this recognition;

And be it further resolved that this association express its appreciation to the various parties for their services to the army veterinary corps and the profession at large.

HOG CHOLERA CONTROL WORK. *Whereas* hog cholera is a serious and widespread disease and has for the last few years caused serious losses. However, through the untiring efforts of the veterinary profession, it has been kept under control with diminished losses;

Whereas the veterinarian alone is especially fitted by virtue of his education and training to cope with the prevention and treatment of hog cholera;

Whereas there is considerable agitation to transfer government hog cholera control work from the Bureau of Animal Industry to another department.

Whereas the Bureau of Animal Industry through cooperation with the various state organizations and veterinary practitioners has successfully eradicated pleuropneumonia and foot-and-mouth disease from our country and has materially diminished the scabies and tick infested areas and has made material progress in the control of hog cholera, thus demonstrating its efficiency;

Therefore be it resolved that this association express its confidence in the Bureau of Animal Industry and urge the Secretary of Agriculture to use his influence for the continuation of hog cholera control work by the Bureau of Animal Industry;

Be it further resolved that a copy of this resolution be sent to the Secretary of Agriculture, U. S. A.

Be it resolved that this association commends all the good work accomplished by the county agricultural agent movement, and especially in those instances where the county agents have cooperated with the local veterinarians;

Be it further resolved that this association deplors the fact that in some instances county agricultural agents have assumed to render services that only qualified veterinarians are prepared to do. Therefore, we urge that the Secretary of Agriculture issue instructions to all county agents to refrain from treating diseases of livestock unless such agents are qualified veterinarians;

Be it further resolved that a copy of this resolution be sent to the Secretary of Agriculture, U. S. A.

Whereas the American Veterinary Medical Association has not held a meeting in the Missouri Valley since 1907;

Whereas the number of veterinarians has increased materially since 1907 and the profession is benefitted by such an association meeting in its territory;

Therefore be it resolved that an invitation be extended to the American Veterinary Medical Association to convene at Kansas City in 1917.

Be it resolved that we sincerely thank the retiring officers and committees for their successful efforts in the carrying out of their various duties;

Be it further resolved that we express as an association our appreciation of the very excellent way in which the local committee on arrangements has provided for the meeting and extend to its members our thanks for their thoughtfulness for our welfare and entertainment.

Officers for the ensuing year are: President, R. C. Moore, St. Joseph; Vice-President, C. C. Hall, Omaha; Secretary-Treasurer, R. F. Bourne, Kansas City.

Trustees: H. R. Morris, Omaha; D. H. Miller, Council Bluffs; Joseph Hughes, Chicago; J. H. Scott, Princeton, Mo.; B. W. Conrad, Sabetha, Kans.

R. F. BOURNE, Secretary.

TENNESSEE VETERINARY MEDICAL ASSOCIATION**OFFICERS, 1916 -**

President, Dr. J. H. McMahon, Columbia, Tenn.; Vice-President, Dr. E. M. Culley, Paris, Tenn.; 2nd Vice-President, Dr. G. P. Whittington, Morristown, Tenn.; Secretary, Dr. F. W. Morgan, Chattanooga, Tenn.; Treasurer, Dr. W. P. Coplin, Humboldt, Tenn.

Executive Committee: F. R. Youree, S. H. Woods, J. W. Scheibler.

Legislative Committee: M. Jacob, P. J. Landes, A. C. Topmiller.

Finance Committee: Wm. Murray, J. J. Gregory, Jas. M. Jones.

Resolutions Committee: Geo. R. White, C. E. Kord, G. B. Blackman.

Ethics Committee: Geo. R. White, F. W. Morgan, G. B. Giltner.

The annual mid-summer meeting of the Illinois State Veterinary Medical Association was held at Peoria, Ill., July 19. Among those on the program were Doctors Dyson, LaCroix, A. H. Baker and Mayo. At the clinic held at the veterinary hospital of Doctors Scott & Brown, numerous demonstrations and surgical operations were performed by Dr. L. A. Merillat. It is said that more than 250 were in attendance.

The next meeting of the California State Veterinary Medical Association will be held in San Francisco Sept. 13.

The semi-annual meeting of the Oklahoma Graduate veterinary Medical Association was held July 19. After committees had been appointed, the visitors were treated to an automobile ride, a trip through the Sulzberger plant and the serum laboratories at Packingtown.

The marriage of Miss Julia Swan and Dr. D. W. Hurst occurred July 20. Dr. Hurst is a graduate of the Ames, Ia. Veterinary College and is in the employ of the government in connection with hog-cholera work. They will establish their home at Tecumseh, Nebraska after August 15.

REVIEWS

DISEASES OF THE DOG AND THEIR TREATMENT

DR. GEORGE MÜLLER

Professor Director of the Clinic for Small Animals at the Veterinary
High School at Dresden and

ALEXANDER GLASS, A.M., V.S. (McGill)

Professor of Canine Medicine in the Veterinary Department
University of Pennsylvania

Fourth illustrated edition, revised and enlarged. Alexander Eger, Publisher,
Chicago, 1916.

The fourth edition of this book has just come from the press, and shows some important changes. The most notable of which are to be found in the chapter on Infectious Diseases, which contains considerable new material on canine distemper, and a discussion of Infectious Hemorrhagic Gastro-enteritis. These two diseases are of great importance to the veterinarian, and dog fancier, hence, a timely revision of this chapter. These diseases are handled according to the present day knowledge of vaccines and serum-therapy.

The chapter discussing the diseases of the digestive system has been re-written, and particularly, that portion dealing with intestinal parasites has been remodelled, and enlarged, so as to include the latest investigations along this line. This subject has been presented in a comprehensive manner so that it will be of inestimable value to both the student and practitioner. Several new things have been added to this chapter, which greatly increase its value over the third edition.

A number of new illustrations have been added to this edition, which will make the book more interesting and valuable, especially to the student.

The author is to be commended for his efforts in bringing forth this revision of such a valuable treatise on the Diseases of the Dog.

The book, as a whole is well bound, is neat in appearance, and should be well received by the student and practitioner of veterinary medicine.

O. V. B.—J. N. S.

A LABORATORY MANUAL IN GENERAL BACTERIOLOGY

WARD GILTNER

Prepared by the Laboratory of Bacteriology, Hygiene and Pathology, Michigan Agricultural College, Ward Giltner, Head of the Department. Pp. XVI, 418. Published by John Wiley and Sons, Inc., New York. Price \$2.50.

As the title indicates, this volume is a laboratory manual in general microbiology. It is the outgrowth of experience in teaching this subject in the Michigan Agricultural College and in its preparation a number of those who have been engaged in the Department of Bacteriology in that institution have taken more or less part. The book is divided into three parts. Part one consists of 53 exercises on general morphological and cultural methods; part two contains 33 exercises on the physiology of microorganisms; part three pertains to applied microbiology and is made up of exercises on the following topics: air microbiology, water and sewage microbiology; soil, dairy, and plant microbiology, animal diseases and immunity. These are followed by an appendix giving an outline for the study of microorganisms, a table for the identification of bacteria and the examination of polluted waters, and directions for the preparation of special culture media, various formulae and other topics of general interest.

As suggested in the title, this book covers a large number of subjects. It is impossible to discuss extensively such a variety of topics fully in the space that can be allotted in a laboratory manual. The text contains 74 illustrations, nearly all of which are excellent and well chosen. It is natural that in the choice of subject matter and in the methods recommended, differences of opinion exist. There are, however, very few changes or additions that suggest themselves. The author seems to have chosen wisely and it is doubtful if an aggregate of 100 exercises could be selected that would be more helpful to the student of general microbiology than those outlined in this volume. The author is to be congratulated in his choice of topics and the clearness with which he has outlined them for the help of the student. These directions can be highly recommended to those who desire to study general bacteriology, including certain of the higher forms. At the end there is a valuable list of text and reference books. The publishers have done their part most satisfactorily.

V. A. M.

OUTLINE OF LECTURES IN SPECIAL PATHOLOGY

SAMUEL HOWARD BURNETT

Professor of Comparative Pathology in the New York State Veterinary College at Cornell University, Ithaca, N. Y. Carpenter and Company, Ithaca, 1916. Pp. 64.

The teaching of special pathology or the structural changes, including the changes in function, of the several organs and parts of the body is a somewhat difficult task. It is, however, exceedingly important that the student of veterinary medicine should have as clear and definite a knowledge of the various changes that may take place in the different organs and structures of the bodies as possible. It is these changes that the practitioner has to take into account in formulating a successful method of treatment. In the teaching of pathology it has been found desirable to divide the subject into three parts, namely, general pathology, special pathology and the pathology of the specific infectious diseases. The first gives the causes and explains what the structural changes are. The second deals with the diseases that affect the different organs. The first two make it possible to differentiate from changes due to general causes, the lesions peculiar to invasion of the body by specific etiological factors.

For some years the author of this book has given a course of lectures, supplemented with laboratory exercises, on special pathology. These lectures are devoted to the cardio-vascular system, respiratory system, digestive system, urinary system and the skin. Under each of these general headings is a carefully arranged synopsis of the changes that may take place in each organ and membrane. A list of the more important text and reference books on comparative pathology is appended.

The purpose of this synopsis is to enable the student to follow the subject and to be able to select from the enormous literature the topics that are of the most importance. This synopsis indicates, in a logical manner, the tissue changes that are known to occur in each organ and tissue. While this volume was prepared primarily for students taking their lectures on special pathology, it would be very helpful to any person who wishes to study the subject. As the author is among the best comparative pathologists and a good teacher, the work embodies both the facts based on scientific research and the perspective of the teacher.

V. A. M.

NECROLOGY

S. M. SMITH

Dr. S. M. Smith of Mitchell, South Dakota died very suddenly of acute indigestion on the 23d of last March.

CHARLES BEECHER POTTER

Dr. C. B. Potter, aged 43, died suddenly of heart trouble at his home at Ithaca, N. Y. He was a graduate of the N. Y. State Veterinary College in the class of 1899, and served for a time as U. S. Veterinary Inspector at Chicago, Ill.

ROMANZO PERKINS

Dr. Romanzo Perkins, aged 71 years, died March 15 at his home at Warsaw, N. Y. Dr. Perkins had been in poor health of late years which resulted in a general break down.

EDWIN J. PECK

Dr. Peck died in August at Cleveland, Ohio from typhoid fever. Dr. Peck was a graduate of the Ontario and McKillip Veterinary Colleges. He was stationed at Cleveland as an U. S. Veterinary Inspector.

THOMAS GREGOR BRODIE

Dr. Brodie died suddenly in London, England, August 20. He has been Professor of Physiology at the Ontario Veterinary College at Toronto since 1908. Previous to that he had been Professor in the Royal Veterinary College in London for a number of years. He was one of the foremost physiologists and devoted much of his time to research. At the time of his death he was serving as a captain in the Canadian Army Medical Corps.

E. LAVALARD

Dr. E. Lavalard, an honorary member of the American Veterinary Medical Association, died at Paris, France, May 29, 1916.

MISCELLANEOUS

Dr. H. E. Lent, formerly of Sauk Center, Minn., has removed to Akeley, Minn.

The death of Dr. J. B. Powell of Pueblo, Colorado is reported.

Dr. Julius Stotchik has taken a position with the Horse Aid Society of New York City.

Dr. George L. Schaefer was seriously injured in a motor accident near Omaha, Neb. He is reported to have sustained a broken arm, a broken leg and other injuries.

Dr. Elinor McGrath of Chicago has the distinction of being the first woman veterinarian elected to membership in the American Veterinary Medical Association.

The twentieth annual meeting of the United States Live Stock Sanitary Association will be held at Chicago, December 5, 6 and 7.

Dr. Hoskins reports an increase of \$700 in contributions to the Salmon Memorial Fund.

Dr. C. A. Fast has removed from Haviland, Ohio, to Van Wert, Ohio.

Dr. Carl W. Gay, for a number of years head of the Department of Animal Husbandry at the Veterinary College at the University of Pennsylvania, has resigned to take a position at the University of Minnesota. Dr. Gay was active in procuring the law regulating the registration of stallions. He is the author of two recent books on Animal Husbandry and is regarded as an authority in his department.

Dr. William V. Lusk, Veterinarian of the 2nd Cavalry has been transferred from Fort Ethan Allen, Vt. to Fort Riley, Kansas.

Dr. E. Perroncito, Professor of Bacteriology at the University of Turin, Italy, and an honorary member of the A.V.M.A., has been elected foreign member of the Paris Academy of Medicine.

An outbreak of anthrax has been reported near Hartford, Conn.

Dr. M. E. Dennington has located at 20 Charlotte St., Baldwinville, N. Y.

Dr. M. L. Plumer has removed from Branchville, N. J. to 206 So. 36th St., Philadelphia, Pa.

Dr. M. F. Barnes, formerly of the North Dakota Agricultural College, has removed to 11th and Buffalo Sts., Franklin, Pa.

Dr. W. E. Stribling has removed from New England, N. D. to Clarence, Ia.

Dr. H. Preston Hoskins has severed his connection with the University of Minnesota to take a position in the Research Laboratories of Parke, Davis & Co., at Detroit, Mich.

In the speech of the Hon. William Hughes of New Jersey in the United States Senate, the following remarks were made relative to the Army Veterinarian:

"It has been stated that there is a tendency to bestow rank on men who are civilians and men who constitute no part of the fighting forces. Yet in the present war the Austro-German forces have lost by death 247 veterinary officers. The German Army is not a social organization; and it has clothed these men with rank and authority higher than that sought to be bestowed under this amendment. They rank from colonel, lieutenant colonel, and major on down to second lieutenants. The British Army has done the same thing, as has also the French Army. The Australian and Canadian Armies—in fact, every one of the armies fighting now on the battle fields of Europe—have recognized the important service that can be, and ought to be, discharged by men doing this work.*****

Before I close and submit this matter to the Senate, I desire to read a marginal note that was placed by the Kaiser on the bill reorganizing the German veterinary service, which sets out much better than I can do the regard in which these men are held in the countries where fighting is a profession:

Upon the veterinary officer devolve high moral, physical, and technical demands in peace and war. Only such young men are to be selected for the military veterinary career who possess a high mind, tact, mental versatility, physical activity, and pride in their profession.

A HORSE'S EPITAPH

Soft lies the turf on those who find their rest
Beneath our common mother's ample breast,
Unstained by meanness, avarice, or pride;
They never cheated, and they never lied.
They ne'er intrigued a rival to displace;
They ran, but never betted on the race;
Content with harmless sport and simple food,
Boundless in faith and love and gratitude;
Happy the man, if there be any such,
Of whom his epitaph can say as much.

LORD SHERBROOKE.

